

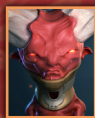
# 3dcreative

Issue 049 September 2009



## Interview

Hao Ai Qiang



## The Gallery

Jonathan Simard, Nikita Veprikov,  
Deniz Ozemre & more!



## FREE Inside Look

Digital Art Masters: Volume 4  
Project Overview by Michal Kwolek



## Project Overview

"Le Rabbit" by Jose Alves da Silva

# PHOTOSHOP SPECIAL

## POST-PRODUCTION & CUSTOM TEXTURES

### Next-Gen Character Creation

Joseph Harford wraps up sculpting the high-poly mesh in ZBrush in the fourth part of this multi-software tutorial series

### Photoshop for 3D

Richard Tilbury shows us how to add volumetric lighting and particle effects to our 3D scenes

### Amphibian Man

Bruno Melo returns to take on the latest topic of an "amphibian-man" in the ZBrush "Manimal" Creation series

### Creating Custom Textures in Photoshop

Richard Tilbury looks at the value of bump and specular maps, and how overlay maps can help disguise tiling issues







## EDITORIAL

Welcome to **Issue 49** at the start of what could be a rainy September for us here in the U.K.! Rainstorms galore today, so my advice: stay indoors and enjoy our September issue, with contributions this month from Hao Ai Qiang, Jose Alves da Silva, Joseph Harford, Bruno Melo, Richard Tilbury, and more!

We're loving this month's cover image by **Jose Alves da Silva** – he's put together a fantastically

detailed "making of" article for us all over on **P.60**, so be sure to check that out if, like Jose, you're interested in adding believable hair to your character creations and want to avoid some of the pitfalls that are inherent with any first time trying out a new technique! We hope to have Jose back with us again as he's currently building up a stunning portfolio that we can only imagine is going to keep on impressing. I'm sure we'll be seeing a lot more from him in the future!

Our interview feature this month is with the very talented Chinese artist, **Hao Ai Qiang**, who has contributed to three of our Digital Art Masters books already, and is really a master in his own right when it comes to creating realistic still life scenes. Hao is a very deep artist who is clearly inspired by the Masters, but who also draws upon memories and his past to create the powerful, nostalgic imagery that you'll see in his portfolio of works. To see just a sample of his work and to find out more about the fascinating artist behind it all, check out his interview on **P.6**.

So tutorials! What have we got? Well, we're mid-way through our four current series' right now, with part three of our Next-Gen Character Creation tutorial series where this month, **Joseph Harford** gets to finishing up the high-poly modeling in ZBrush (**P.78**) in preparation for the next step: mapping and unwrapping (coming next month). So follow Joseph on the last leg of his ZBrush sculpting journey in this issue, before we invite Gavin Goulden, James Busby and John Hayes back to the party next month to take us into the other software versions – 3ds Max, Maya, LightWave and modo – where we'll map and unwrap ourselves silly!

What else? Remember those Manimals? Well, we've got more of them! Yup, **Bruno Melo** is back with us again to take us through the creation of his rather amphibious-looking man. Bruno has this time gone for a more stylized approach to his last (see his Bird-Man creation in the June 2009 issue!) and has created a body-building toad-like creature that you wouldn't want to meet down a dark alley, that's for sure! Flip to **P.40** to follow Bruno's latest workflow when merging animal features with those of humans for interesting results!

3DTotal artist, **Richard Tilbury** is also back again to bring us two inspired Photoshop tutorials for 3D artists! We'll see how to add lighting and particle effects to our 3D renders to improve our scenes without even touching the original render – a completely nondestructive way of working which will speed up your workflow and yield some stunning results. Simple methods with great results – check them out on **P.30**.

## CONTENTS

What's in this month?

## HAO AI QIANG

Master of the Still Life!

## THE GALLERY

10 of the Best 3D Artworks

## PHOTOSHOP FOR 3D

Part 3 – Lighting & Special Effects by Richard Tilbury

## ZBRUSH "MANIMAL" CREATION

Part 4 – Amphibian-Man by Bruno Melo

## CUSTOM TEXTURES

Part 2 – by Richard Tilbury

## "LE RABBIT"

Project Overview by Jose Alves da Silva

## "KIDS"

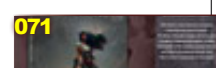
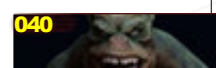
Digital Art Masters: Volume 4 Free Chapter!

## ABOUT US

3DTotal.com Ltd Information & Contacts

## NEXT-GEN CHARACTER

Series for ZBrush, 3ds Max, LW, Maya & modo



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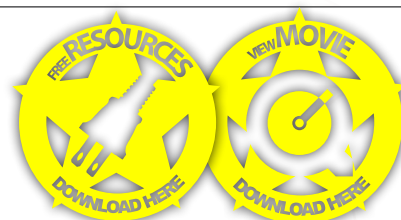
Chris Perrins

## MARKETING

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## FREE STUFF!

Wherever you see this symbol, click it to download resources, extras and even movies!



Then head on over to part two of the Custom Textures tutorial where Richard looks at how bump, specular and overlay maps can be utilized in Photoshop to create the illusion of detail without adding additional geometry to your 3D scene (**P.52**). It's all about saving time and increasing productivity, so we hope you'll enjoy the introduction of these Photoshop tutorials in 3DCreative!

The Gallery this month features new work from **Jonathan Simard** and **Pascal Ackermann** – check out our pick of the month over on **P.18**. And be sure to stick around for next month's issue, too, as we'll be interviewing Blur artist, Sze Jones, mapping and unwrapping with professional character artists, looking at adjustments and layer styles in Photoshop, creating an "insect-man" in ZBrush, wrapping up the final stage of our Custom Textures series, and Zoltan Miklosi will be bringing us the making of one of his stunning Neo-Renaissance characters. Till then, enjoy this month's issue! **ED**.





## SETTING UP YOUR PDF READER

For optimum viewing of the magazine, it is recommended that you have the latest Acrobat Reader installed. You can download it for free, here: [DOWNLOAD!](#)

To view the many double-page spreads featured in 3Dcreative magazine, you can set the reader to display 'two-up', which will show double-page spreads as one large landscape image:

1. Open the magazine in Reader;
2. Go to the **VIEW** menu, then **PAGE DISPLAY**;
3. Select **TWO-UP CONTINUOUS**, making sure that **SHOW COVER PAGE** is also selected.

That's it!

## Get the most out of your Magazine!

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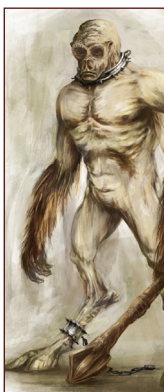


## CONTRIBUTING ARTISTS

Every month many artists from around the world contribute to 3DCreative magazine. Here you can find out about them. If you would like to be a part of 3DCreative or 2DArtist magazines, please contact: [lynette@3dtotal.com](mailto:lynette@3dtotal.com)

### NEXT GEN CHARACTER

This tutorial series provides a comprehensive guide through the process of creating a 3D character intended for use within a next-gen console environment. **Joseph Harford**, **Gavin Goulden**, **James Busby** and **John Hayes** tackle this new series providing versions for ZBrush, 3ds Max, LightWave, Maya, and modo



### RICHARD TILBURY

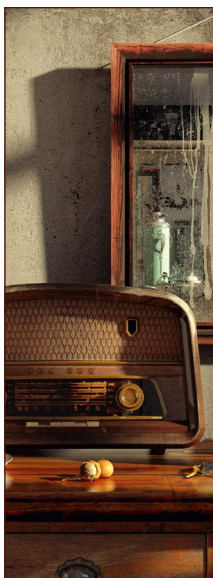
Has had a passion for drawing since being a couple of feet tall. He studied fine art and was eventually led into the realm of computers several years ago. His brushes have slowly been dissolving in white spirit since the late 90s, and now his graphics tablet has become their successor. He still sketches regularly, balancing his time between 2D and 3D. <http://www.richardtilburyart.com>  
[rich@3dtotal.com](mailto:rich@3dtotal.com)



### HAO AI QIANG

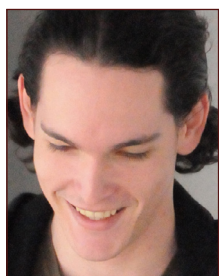
Born in 1981, Hao graduated from Fushun Teachers College of Liaoning, with his speciality being in art education.

He currently works for Crystal Digital Technology Co., Ltd Institute of Digital Education (Shanghai), having taken a change from architecture to now teaching animation. He's had work published in *Digital Art Masters*: Vol. 2, 3 and 4. <http://metalcrater.cgsociety.org>  
[metalcrater@hotmail.com](mailto:metalcrater@hotmail.com)



### JOSEPH HARFORD

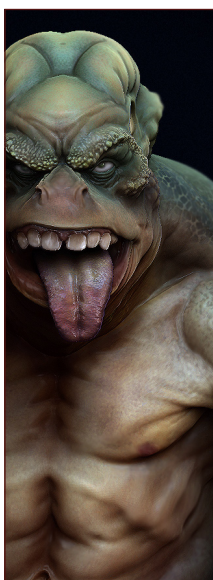
An avid artist since childhood; after freelancing in advertising and film he worked in the games industry at Crytek GMBH, the German games company behind *Far Cry* and *Crysis*. He later moved to Ubisoft as a senior character artist, and has since founded ShineLabs, a digital asset and artwork company, where he currently works. <http://www.josephharford.com>  
<http://www.shine-labs.com>



### BRUNO MELO

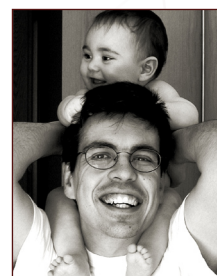
A 24-year old character artist living in Sao Paulo, in Brazil, who is currently working freelance for feature films and

games. He has been fascinated with game and film art since a child, and he started studying CG and traditional art about 5 years ago. He's always hoping to have the chance to participate in big projects that will help him to grow as an artist. <http://bmelo.cgsociety.org/>  
[bmmsouza@gmail.com](mailto:bmmsouza@gmail.com)



### JOSE ALVES DA SILVA

Working in the 3D field since '92, focusing mainly on architectural visualization; he has a degree in architecture – arch-viz allows him to join two of his favorite subjects: architecture and 3D. He founded Pura Imagem ([www.puraimagem.pt](http://www.puraimagem.pt)), which is mainly dedicated to arch-viz and has been successful over the last 12 years, but his true passion is character design – drawing/modeling cartoon creatures! [joalvessilva@netcabo.pt](mailto:joalvessilva@netcabo.pt)





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# HAO AI QIANG

Hao Ai Qiang has been intriguing us with his stunning, realistic scenes for the last few years, captivating us with imagery that recollects times that have long gone, filling us with a longing to reach into our own histories and explore what was once lost ... We catch up with Hao this month to find out how he got into CG, what he does to get away from it all, and just how important photography is when working with realism in CG art!

“COLLECTING THINGS WAS JUST SOMETHING I DID DURING CHILDHOOD. I DON'T REALLY HAVE ENOUGH SPACE TO KEEP THINGS LIKE THAT ANYMORE. BUT I GUESS I HAVE A NEW COLLECTION METHOD NOW: GATHERING IMAGES!”



## INTERVIEW WITH HAO AI QIANG

Hello Hao! Now this isn't the first time we've met you as we've worked with you on not one but three of our *Digital Art Masters* books already, so we thought it was about time we got to know you a little better and share your work with our 3DCreative readers, too! So to start us off, can you tell us a little about yourself and how you got started in computer graphics?

Sure! When I was a little boy, it was my parents who first discovered my artistic talents and it was from there that I began my long journey of studying traditional drawing and developing my skills in art. It was after nearly 10 years, in 1998, that I first came into contact with CG. And it was then that I realized I could use a computer to draw just the same as if I was using canvas ... That's where it all began.

**"THOSE LITTLE OBJECTS  
HAD THEIR OWN SOULS,  
THEIR OWN LIVES."**

Ah, so what was your first encounter with CG?

I got my first very own computer in 1999. About a month later I produced my first piece of



complete work. Before that I had been using the school's old computers to practice modeling and lighting.

Ok, I think I confused us both there, sorry! What I love about your work, Hao, is that every one of your images tells us a story, giving each of your artworks a soul. The pieces in your portfolio often seem very personal. Can you tell us about how you go about seeking your inspiration, and what kind of life experience and events you find work best when described through your art?

Throughout my childhood I was wild about collecting gadgets: broken clocks, Matchbox toy cars, and just about anything else I could find to fill my drawers! At the time I believed that all those little objects had their own souls, their own lives. When I felt lonely I would talk about it with them, and arrange them into different



combinations depending on what it was I was feeling or talking about. It was here that I found my love of still life.

I love this story! Do you still collect gadgets even today or do you have any new passions for collecting things that we might start to see revealing themselves in your future works? Collecting things was just something I did during childhood. I don't really have enough space to keep things like that anymore. But I guess I have a new collection method now: gathering images! I always take my camera to take photos on the street, at the market, or in a museum. And all I need to store those is a good hard drive!

[Laughs] That's great, I love how you see collecting images as a step up from your childhood hobbies. Brilliant! You are clearly inspired by the Masters, and indeed your CG works are Masters of your own trade, too! Can you tell us a little about the Masters that you most admire, and what it is about their work that you find most useful and transferable with regards to creating your CG concepts and interpretations of some of the greats?

The 17th century Dutch still life painters, W.C.



Heda, Willem Kalf, and Pieter Claesz are my favorite Masters. Other painters such as Vermeer, M.C. Escher, and Vincent Van Gogh are also amongst some of my favorites in other categories of painting. In my own work you can find reference to some iconic content and techniques from these Masters. For example, some of my works' compositions, the layout of object in scenes, are referenced from Vermeer's paintings. And material detail, glass and metal reflection/refraction detail, was learned from Heda's still life paintings.

Great, so you've told us about the Masters that inspire you from the past, but what about the present, I now wonder? Who inspires you the most in the current fine art/CG fields? Is there anyone in particular, or are there any websites/galleries that you find particularly inspiring?

In terms of CG, I think Ben Fleming was the first person to lead me towards creating my own CG artwork. I just read his book; he explains













METALCRAZER





what realism is, and how to achieve it. Stefan Morrell, Toni Bratincevic and Marek Denko are the artists I like best. They all have great skill and unique styles. I can also find inspiration from any photography or graphic design site. Flickr.com is a real gold mine!

It is indeed! From all the work in your portfolio, it's clear that you excel at creating some of the most beautiful still life scenes that we can see in the CG community. Can you share with us any tips or tricks that may help others out there who are trying to get to grips with creating scenes in

3D? For example, what software do you use; do you have any preferred techniques when it comes to texturing/applying materials; ... any secrets?

I'm a 3ds Max user, but in recent years I have started to use other software in my workflow, too. Now I always use UVLayout, BodyPaint and Mudbox to solve any problems in my work; for example to UV-map a complex high-poly model, to remove texture seams, and to sculpt model details. I've found that if you use 3ds Max alone, it's possible that you can waste a lot of time and perhaps still not even solve all of your problems.







If you want to make a realistic looking material, it's very important to observe the real world material. If the circumstances don't allow you to see it for yourself in real life, then you'll need some references. Analyze photos: look at the surface color, the strength of bump, highlights, reflections, translucency ... You will find the answer if you look close enough! Use different textures to control the attributes, just like nature's variety.

That's right, you can definitely tell when artists have actually looked at the material they're

recreating in 3D and when they haven't. Could you give us an insight into one of your favorite materials/textures that you use in your scenes? And how did you set it up based on the information you got from the real world material? Yes, sure! When I start my material work I always shoot lots of photos. I try to choose my subjects so as to capture the kinds of materials, or similar ones, that I need. However, if I just used photos directly in my artwork then my images would look very boring and the finished products would have a very bad effect. It's important to eliminate shadows, reflections



and to use texture overlays, hand painting and color correction in order to achieve a good effect. Once the color map has been created I'll generally use the channels to extract the bump and glossy.

## "I TAKE MY CAMERA OUT TO PHOTOGRAPH THE WORLD."

Ok great, thanks for that! So now tell us a little something about yourself. What do you do in your spare time to relax away from the glare of the computer screen?

Most of my spare time is consumed at the computer because here in Shanghai the weather is most often cloudy or rainy, but when the weather is dry and clear I take my camera out to photograph the world. I find photography to be the very best relaxing past-time.

Sure, we are all great lovers of photography here at 3DCreative – we can only wish for a little more sun, too! Can you tell us about what it's like living in Shanghai and what inspires you the most about the city? There are so many talented Chinese artists emerging into the CG world, it would be great to know a little about what life is like and how it affects your art!

My home town is far away from Shanghai – over 2000 kilometers. The weather and food here is



completely different to that in Shanghai, but I prefer and choose to live here. I was attracted here by the impact of traditional and modern, of west and east, of art and economy. There are lots of talented people all around me. Like me, I think because the city and life in the city changes so rapidly, they find it exciting and inspirational. Emotional volatility is the source of creative power!

What a perfect quote to end us on, Hao. Thank you so much for this interview; we wish you

every success in life and, of course, we look forward to seeing your next masterpiece. Thank you!

## HAO AI QIANG

For more work by this artist please visit:

<http://metalcraer.cgsociety.org/gallery/329542/>

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Deniz Ozemre  
Joshua Cushman  
Pascal Ackermann  
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## CONTROL PANEL

Andrew Finch

[afinchy@gmail.com](mailto:afinchy@gmail.com)

(Right)



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Anto Juricic - Toni

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# BIRD FOR A DEMON

Nikita Veprikov

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(Right)



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<http://www.JoOfDeath.com>

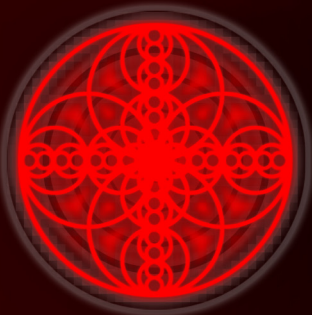
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Flip to  
Page 078  
for the third part  
of our new Mega  
Tutorial Series

# NEXT GEN CHARACTER CREATION SERIES

This series of tutorials provides a comprehensive guide through the process of creating a 3D character intended for use within a next gen console environment. As such, the design of the model will be tailored towards the eventual aim of functioning within a game engine and viewed in real-time. The series will cover all of the key stages of the 3D pipeline from sculpting the initial mesh in ZBrush and optimizing it in the principal 3D packages, through to texturing and applying next gen shaders. The inclusion of ZBrush tutorials will address the methods of sculpting both a low-poly mesh as well as a highly detailed version used to generate a normal map, and accompany the remaining software specific chapters that will detail topics that cover mapping, materials, lighting and rendering.

## FOLLOW

The third chapter of our new tutorial series wraps up the high-poly modeling from last month (part 1 featured in the August 2009 issue). These two parts are ZBrush specific and cover the methods used to sculpt a detailed and high-poly mesh from the low-poly version. The value of subdivision alongside the key tools and brushes used in the process will form an integral part of the tutorial. It begins by importing the optimised mesh back into ZBrush in readiness for a methodical approach to refining each of the limbs and body parts.

So if your interested in seeing the third chapter of this amazing new series, please flip to the back of this magazine and enjoy.

ZBRUSH | PAGE 078





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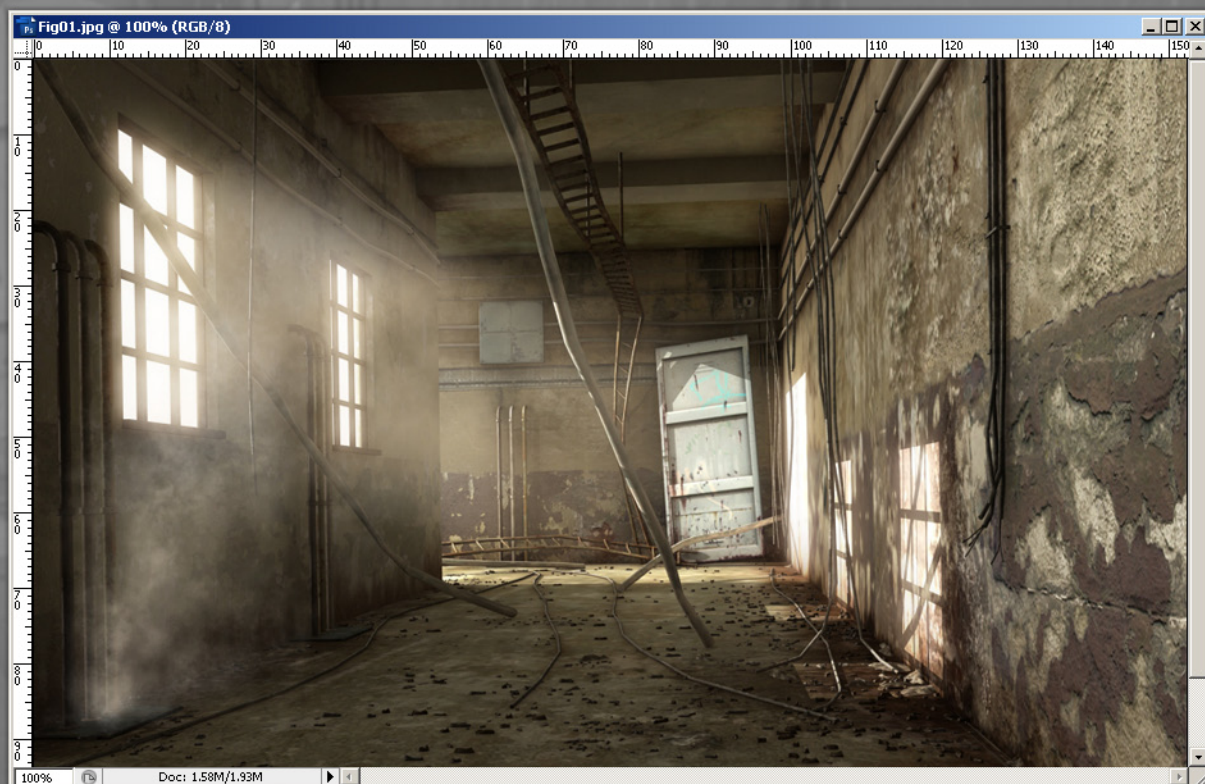




“...WE CAN CREATE WHAT IS COMMONLY KNOWN AS “LIGHT BLOOM”. THIS IS AN EFFECT OFTEN USED IN COMPUTER GRAPHICS AND DESCRIBES THE WAY LIGHT CAN APPEAR TO “BLEED” BEYOND ITS NATURAL BORDER WHEN SEEN THROUGH A CAMERA LENS.”

# Photoshop for 3D

This series of tutorials aims to show the value of post-production and more specifically the ways in which Photoshop can be used to aid the 3D pipeline. Over the course of six chapters we shall focus on the various tools and techniques on offer in Photoshop that are frequently used to improve 3D renders. Compositing passes, adding particle effects, improving lighting and making general colour adjustments are a few of the topics covered, as well as ways to create backgrounds that both complement and enhance characters. The methods presented within this series can provide an efficient alternative to lengthy render tests and experimenting with numerous settings, and will enable artists to seamlessly blend 2D techniques into a 3D process, resulting in a versatile and streamlined workflow.



CHAPTER 1  
Render Passes

CHAPTER 2  
Retouching Final Renders

CHAPTER 3: LIGHTING & SPECIAL EFFECTS

This chapter takes off where the previous one ended and assumes that we have now composited our passes into a single render. It focuses on remedying general problems concerning issues such as tiling textures along with effective ways of applying dirt maps to help integrate surfaces by way of the Vanishing Point filter. The other key tools that are explained are the Clone Stamp and Healing Brush which are used to retouch and tidy up any unsatisfactory areas

CHAPTER 4  
Curves, Levels, Colour Balance & Layer Styles

CHAPTER 5  
Layer Masks & Adjustment Layers

CHAPTER 6  
Creating Backgrounds



DOWNLOAD HERE!  
The Smoke brush that has been  
used in this tutorial



## CHAPTER 3: LIGHTING AND PARTICLE EFFECTS

**Software Used:** Photoshop

### INTRODUCTION

This third chapter is a continuation from Chapter 2 (August 2009 issue), and will use the same scene as before. We will look at ways to enhance the lighting effects and mood of the render and create a dusty atmosphere that suits the subject matter.

In Fig.01 you can see the stage where we ended Chapter 2. The render at the moment is composed of just three layers: Color, Specular and Ambient Occlusion passes (Fig.02).

You will notice that the Ambient Occlusion (AO) pass is set to Multiply at 49% Opacity. You may need to alter the Opacity depending on your preferences, as this is purely subjective, but I do find that 100% is always too dark. The Specular pass is set to Screen mode at 60%, in this instance.

I find that tinting the AO pass often helps, with the hue dependant on the particular scene, but in this case I have made it warmer. Go to Image > Adjustments > Color Balance and move the sliders accordingly (in this case towards the red and yellow) (Fig.03).

These three passes make up the 3D elements that have already been composited in Photoshop with the tweaks that we dealt with

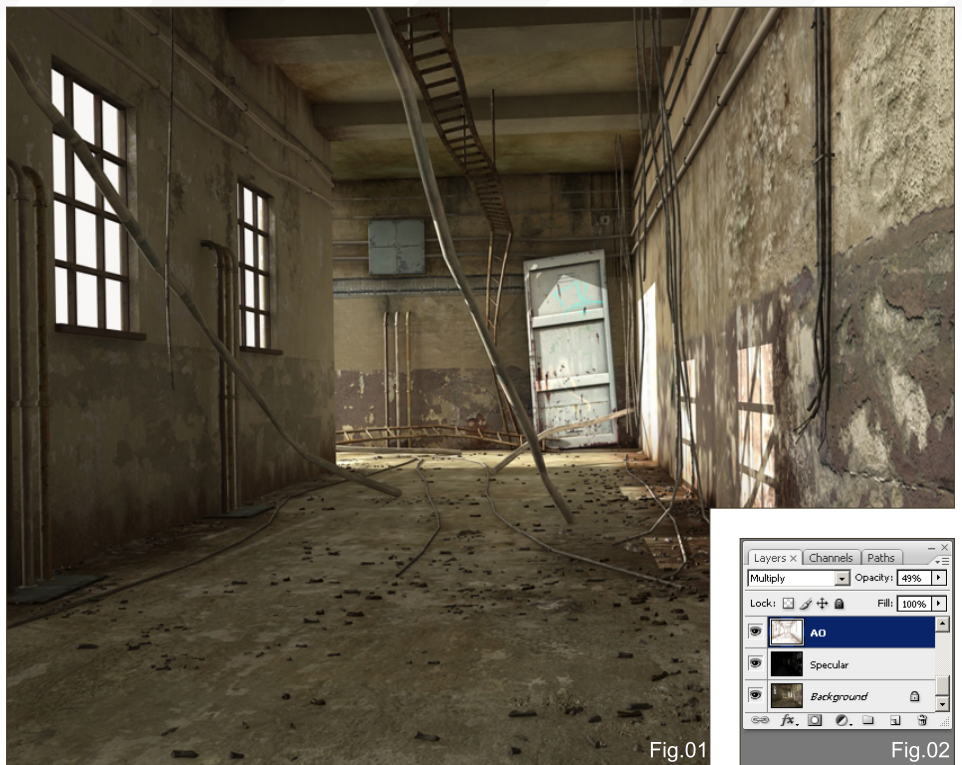


Fig.01

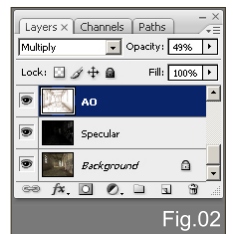


Fig.02

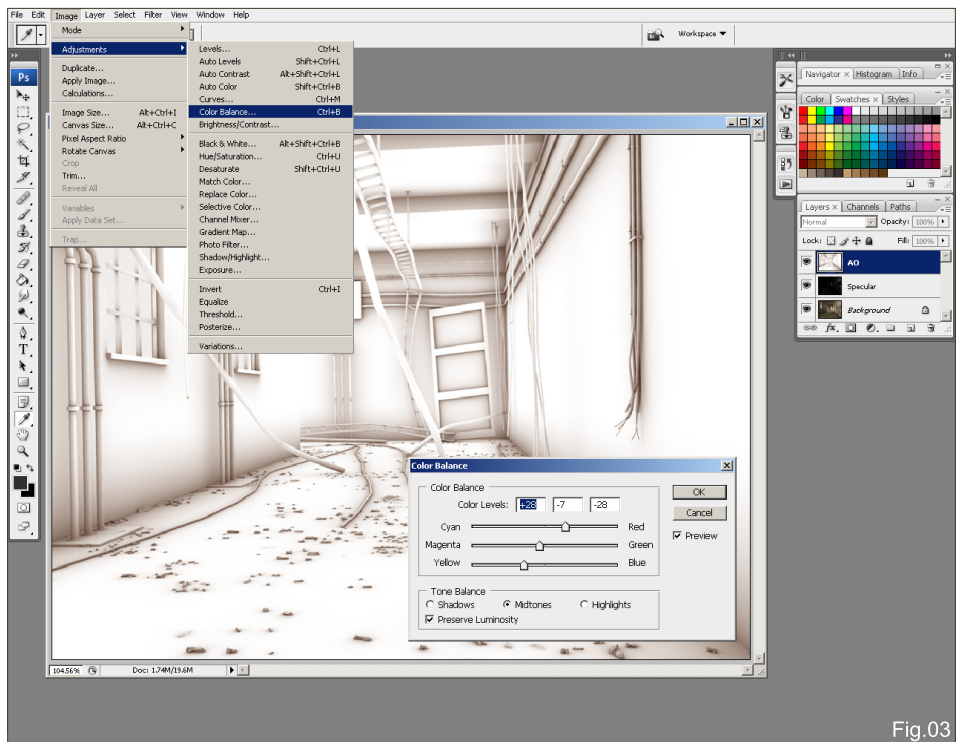


Fig.03



Fig.04

in the last tutorial. We could leave the scene as it is, but instead we will use what we have so far in our render to suggest ways in which to enhance things a little.

### “LIGHT BLOOM”

There is a strong light source outside the building, left of the picture, which has cast

highlights on the opposing wall. As such, we can create what is commonly known as “light bloom”. This is an effect often used in computer graphics and describes the way light can appear to “bleed” beyond its natural border when seen through a camera lens. In Fig.04 you can see the result of this effect around the window.



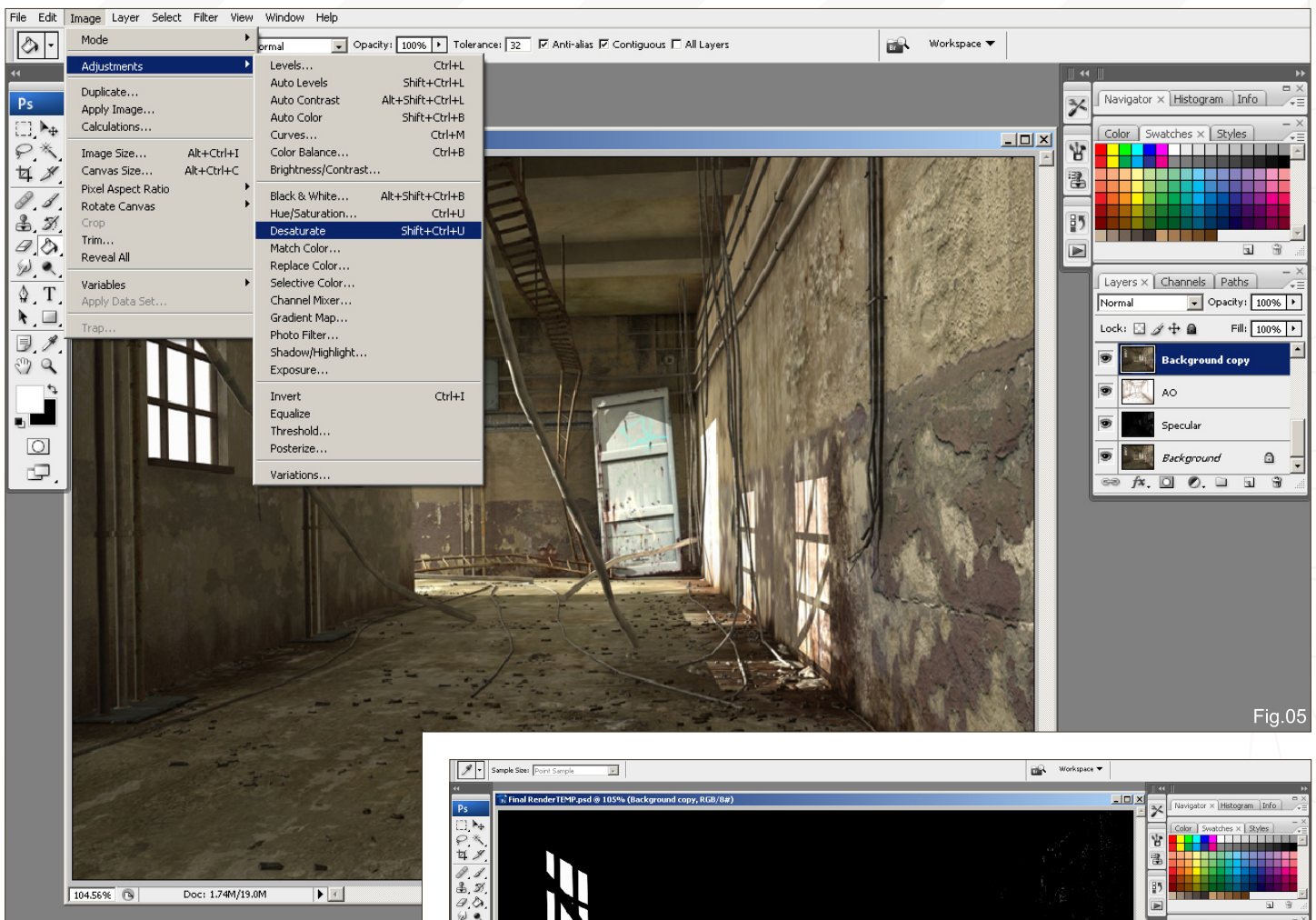


Fig.05

The way to achieve this is by first duplicating the Color pass (the background layer in this case) and then put this above all the other layers and desaturate it: Image > Adjustments > Desaturate (Fig.05).

Next go to Image > Adjustments > Curves, click on the diagonal line and adjust it similar to what is shown in Fig.06 until you have darkened most of the image, except for the sunlit sections. To tidy up you can use a brush to paint over any unwanted areas that are not black (Fig.07).

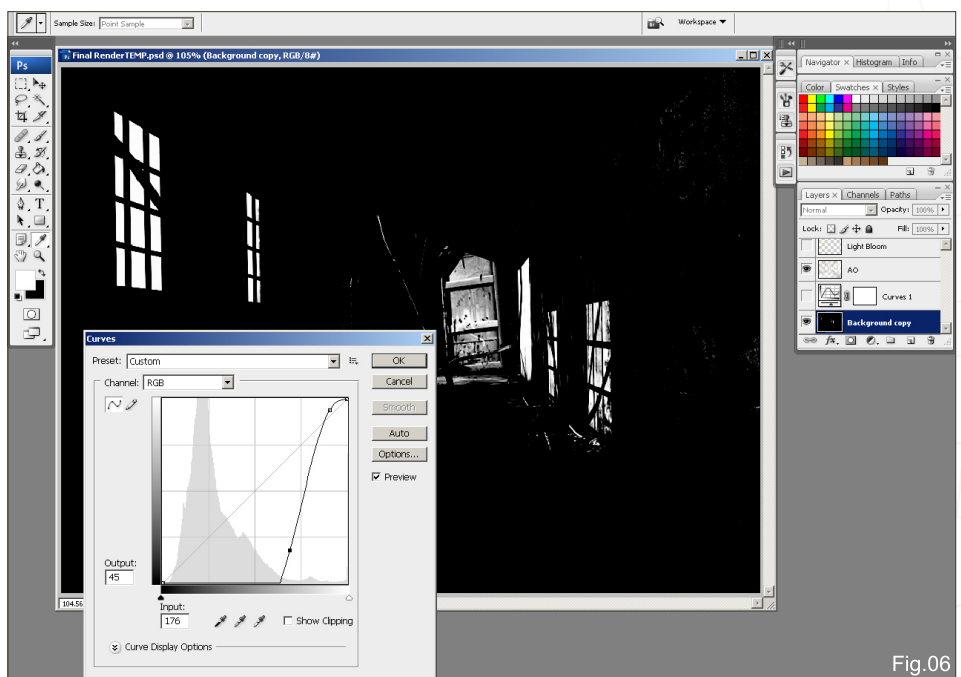


Fig.06

Now go to Filter > Blur > Gaussian Blur and set the Radius to somewhere around 7 pixels (Fig.08).

You can either leave this layer black and white, or you can tint the white areas, which I have done by adding a warmer tint similar to the Ambient Occlusion layer. Place this layer above

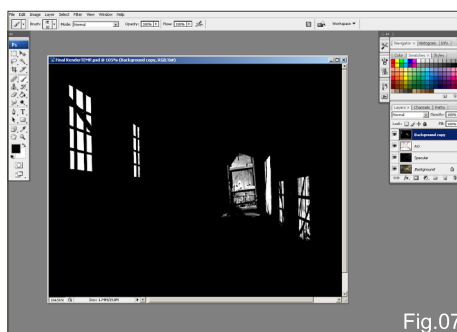


Fig.07

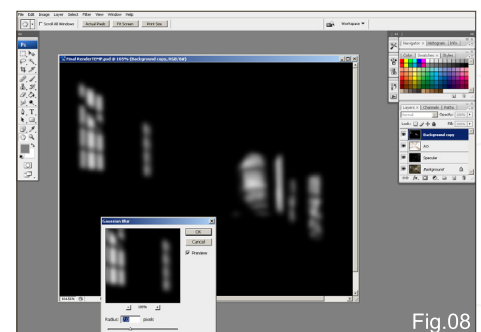


Fig.08



the rest and set it to Screen mode. In **Fig.09** you can see this layer, called "Background copy", and the resultant effect it has. I decided that the door did not work so erased this section, indicated by the white area on the layer thumbnail.

To add even more intensity to the light from the windows make a selection area around both, and then on a new layer fill these with either a white or a pale yellow (**Fig.10 – #2**).

Now apply some Gaussian Blur (Radius around 14) and then set this layer to Soft Light (**Fig.10 – #3**).

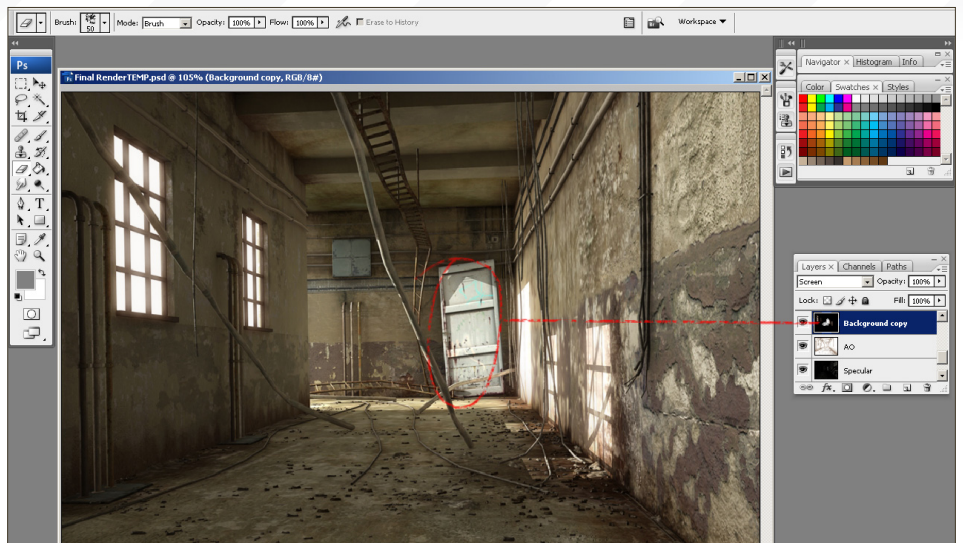


Fig.09

With these effects complete we shall now go on and add some volumetric lighting to suggest a dust filled corridor.

## VOLUMETRIC LIGHTING

Begin by creating a new layer (named volumetric) and use the Lasso Tool to make a selection area that will correspond to the beam of light that will filter through the near window (**Fig.11**).

Make the foreground color a pale orange and then select the Gradient Tool (highlighted in red on **Fig.11**) and then click on the box indicated by the arrow.

This will open up the Gradient Editor, as seen in **Fig.12**. Be sure to select Foreground to Transparent, which is the second box from the left on the top row, and then click OK.

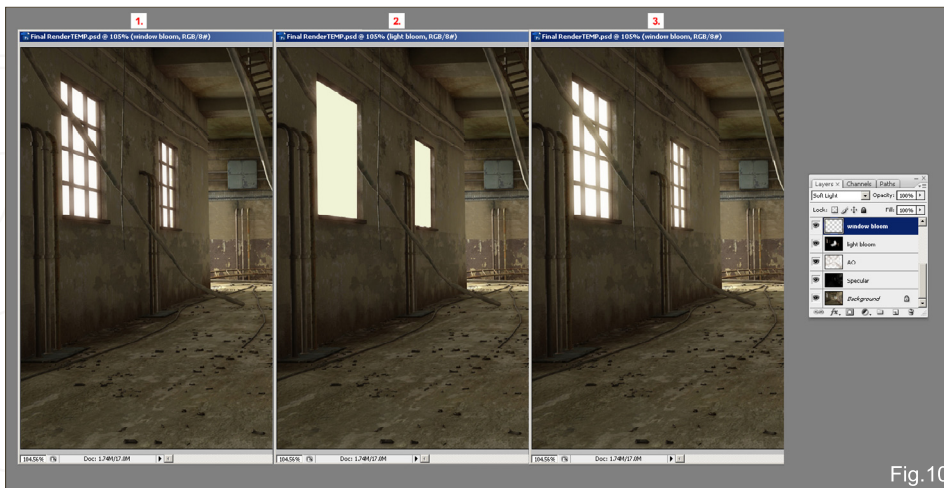


Fig.10

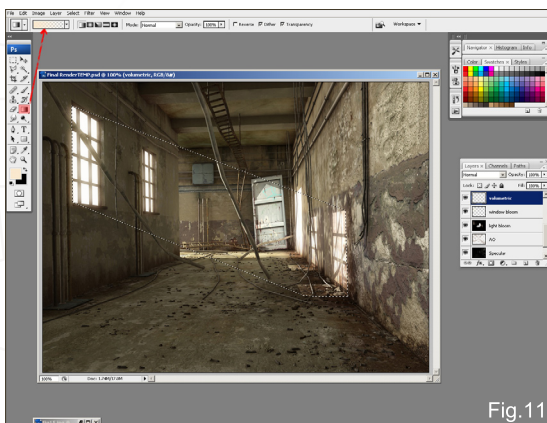


Fig.11

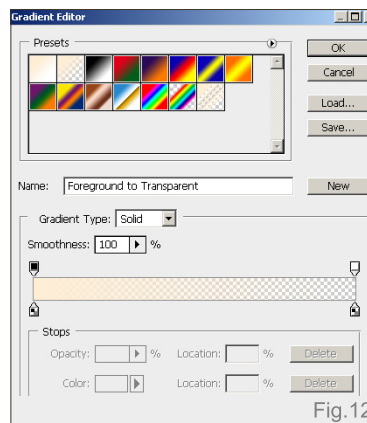


Fig.12

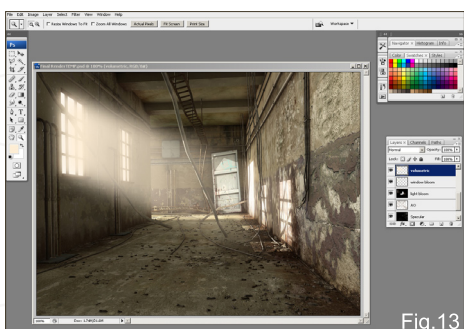


Fig.13

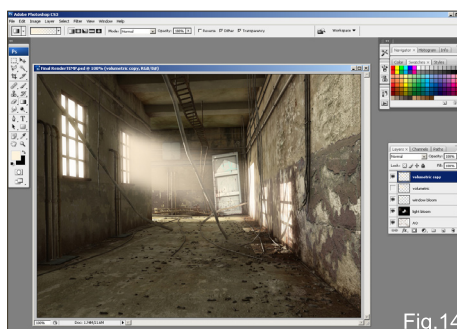


Fig.14

Once done, click and drag from the window edge of the selection area to the opposite side against the wall. Apply some Gaussian Blur to soften the effect and aim for something similar to **Fig.13**.

Now duplicate this layer and scale it to match the distant window (**Fig.14**).



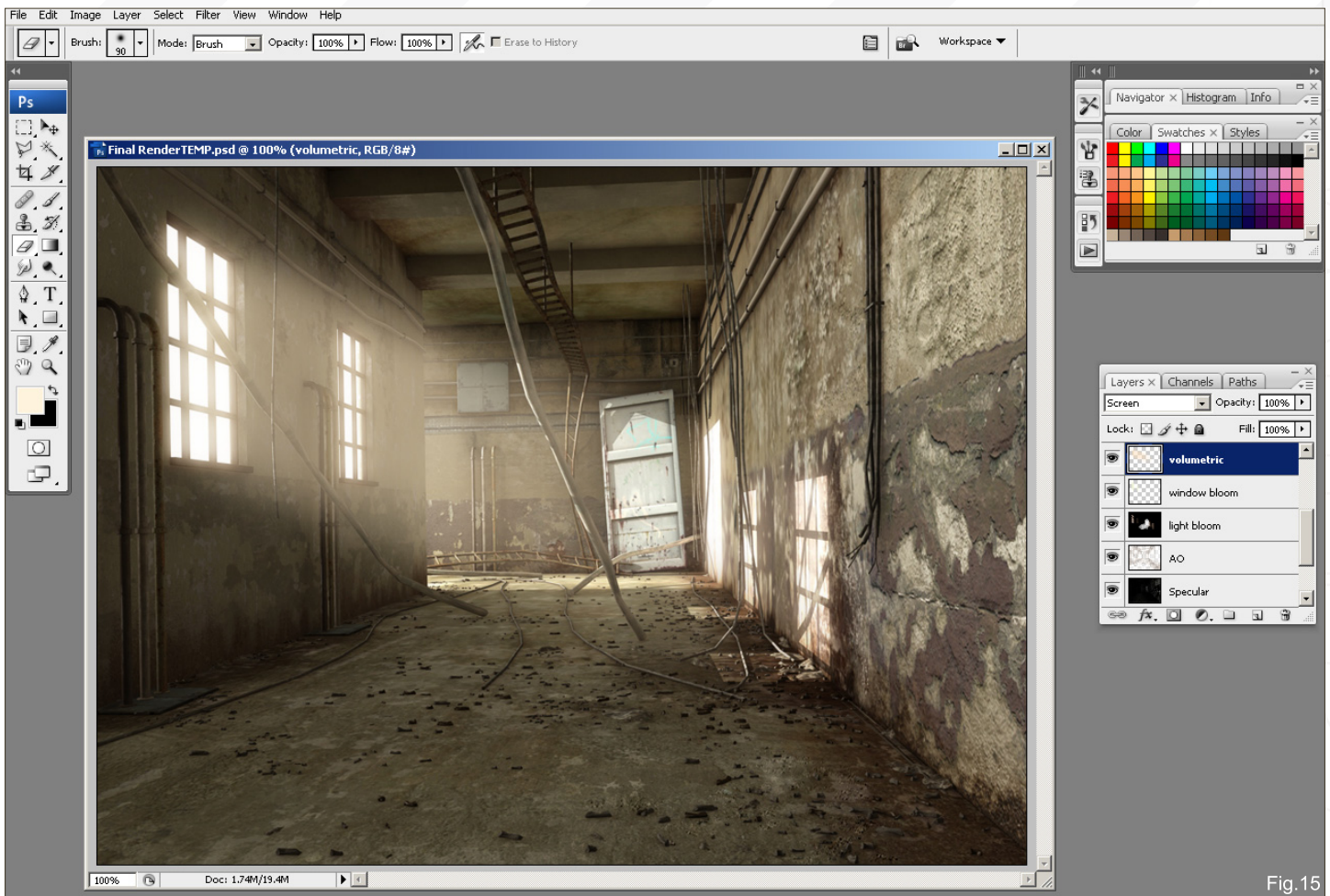


Fig.15

Turn the Opacity of this layer down to around 25%, and the initial one to approximately 60%, and then merge the two together (Fig.15).

You could at this point refine the edges of the light beams using a soft Eraser Tool if need be, or even alter the Color Balance if you wish (I have added a warmer tint using the same method, as done previously with the AO pass).

The volumetric lighting now helps give the atmosphere a more dusty feel, but to enhance it further we are going to break it up slightly.

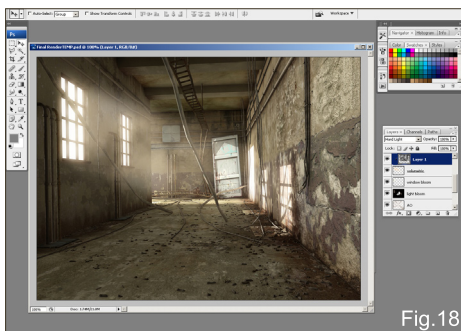


Fig.18

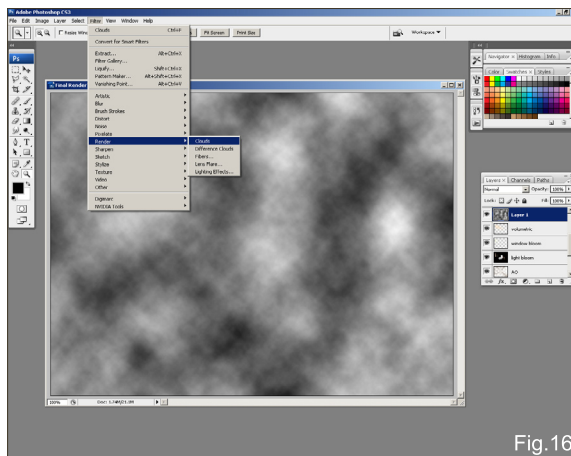


Fig.16

Create a new layer and, making sure you have black and white as the foreground/background colors, go to Filter > Render > Clouds. This will fill your layer with an abstract and random pattern similar to Fig.16.

Make sure this new layer is above the volumetric lighting, and then Alt + left-click on the red line that divides the two layers, as seen in Fig.17.

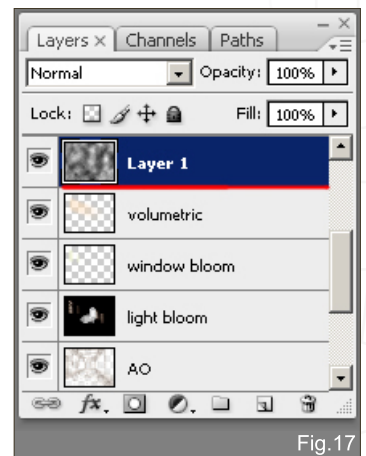


Fig.17

This will create a clipping mask that will only reveal the clouds layer within the boundaries of the volumetric lighting. Set the layer blending mode to Hard Light and then feel free to move or scale the clouds to refine the pattern (Fig.18).

You can increase the contrast of the clouds layer to make it more apparent, and even add some noise to create visible particles if you wish, but I prefer to keep the things subtle.



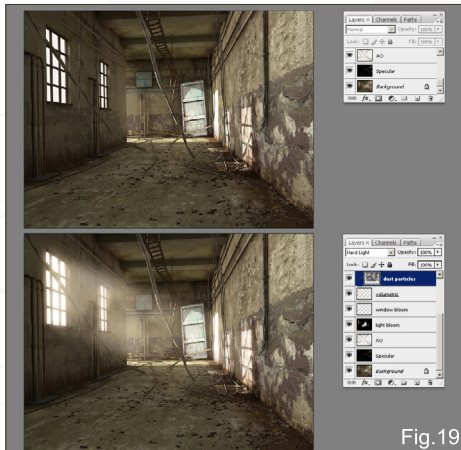


Fig.19

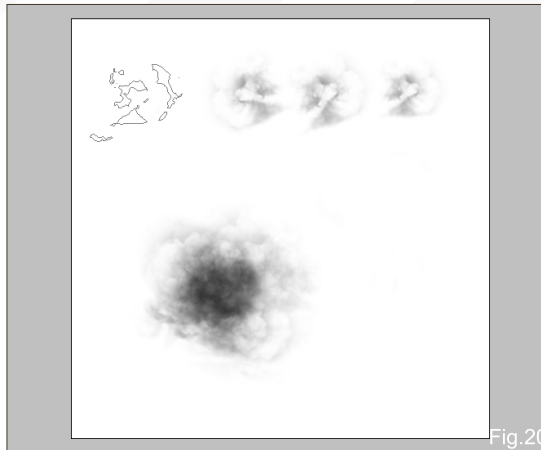


Fig.20

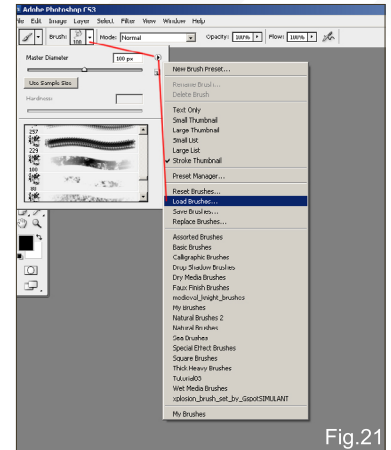


Fig.21

Through Photoshop we have been able to enhance the lighting and create the effect of strong sunlight filtering into our scene, and give the impression of a dusty atmosphere. This method has been relatively quick to achieve and I believe adds drama to the image (Fig.19).

## STEAM

One other enhancement we could add here is some steam emanating from the near set of

pipes on the left. Again, this is a particle effect that could be achieved in 3D along with the dust, but it is quicker to produce in 2D.

In Fig.20 you can see a custom brush I already had stored which was extracted from a photo of some smoke. I have included the brush file in order that you can see its parameters for yourself (click on the **Free Brushes** icon to download).

To load it, go to the root folder of Photoshop on your computer and then to Presets > Brushes, and copy it into this folder (you should see a group of ABR files there).

In Photoshop now, click on the Brush Tool, and then on the small arrow on the menu bar (next to the brush thumbnail). Now click on the upper right arrow next to Master Diameter, and then on Load Brushes (Fig.21). Select the smoke brush and hit Load.

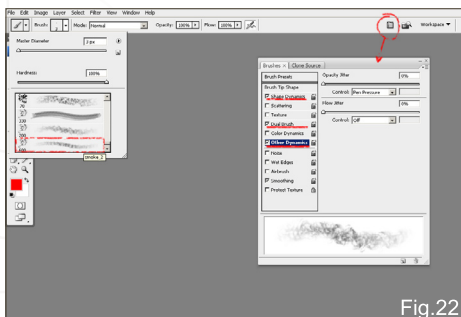


Fig.22

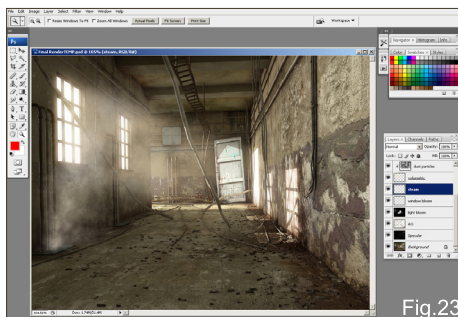


Fig.23

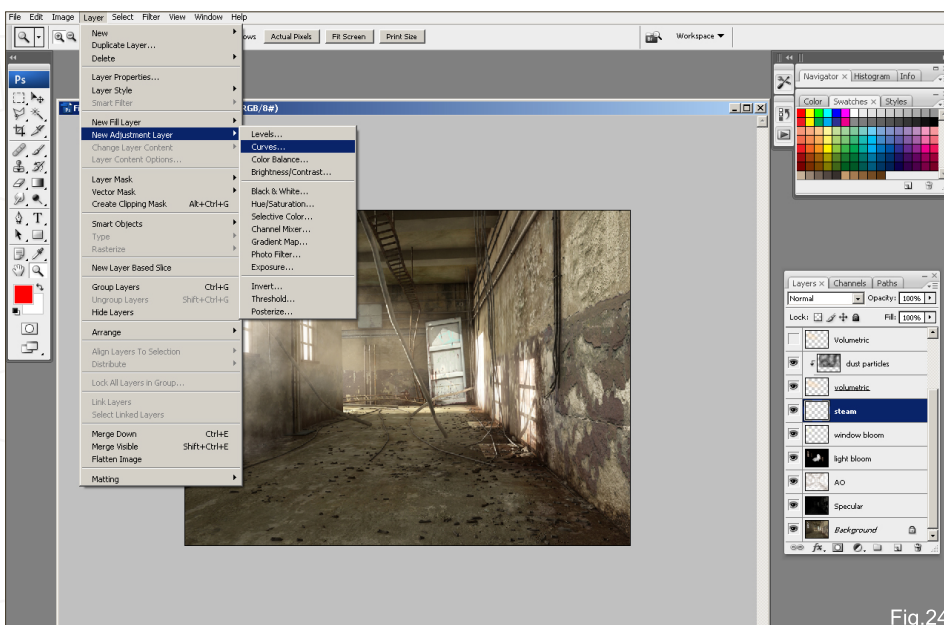


Fig.24

If you look in your brushes menu you should now find the brush at the very bottom of the list (Fig.22). If you click on the small icon ringed in red, this will open up the brushes palette where you can see the settings for your brush. The key sections are the ones underlined, so go ahead and experiment with the parameters as this is the best way of understanding what they do.

Once you have your brush selected you can go ahead and paint in your steam. You can use the Airbrush Soft Round to erase the edges if need be, and also alter the Opacity and Color Balance to better integrate it (Fig.23).

This essentially wraps up this tutorial, but there is one last thing we could do to emphasize the lighting: add an Adjustment Layer.

## ADJUSTMENT LAYER

Click on the steam layer and then go to Layer > New Adjustment Layer > Curves (Fig.24).



Now adjust the curves similar to **Fig.25** by clicking and dragging on the line which will have the effect of increasing the contrast slightly, and because it is below the volumetric layer it will make the sunbeams stand out a little more.

With this done, we have arrived at our final version, which can be seen in **Fig.26**.

Next month: **Chapter 4: Curves, Levels, Color Balance, and Layer Styles**

**RICHARD TILBURY**

For more from this artist visit  
<http://www.richardtilburyart.com/>  
 or contact  
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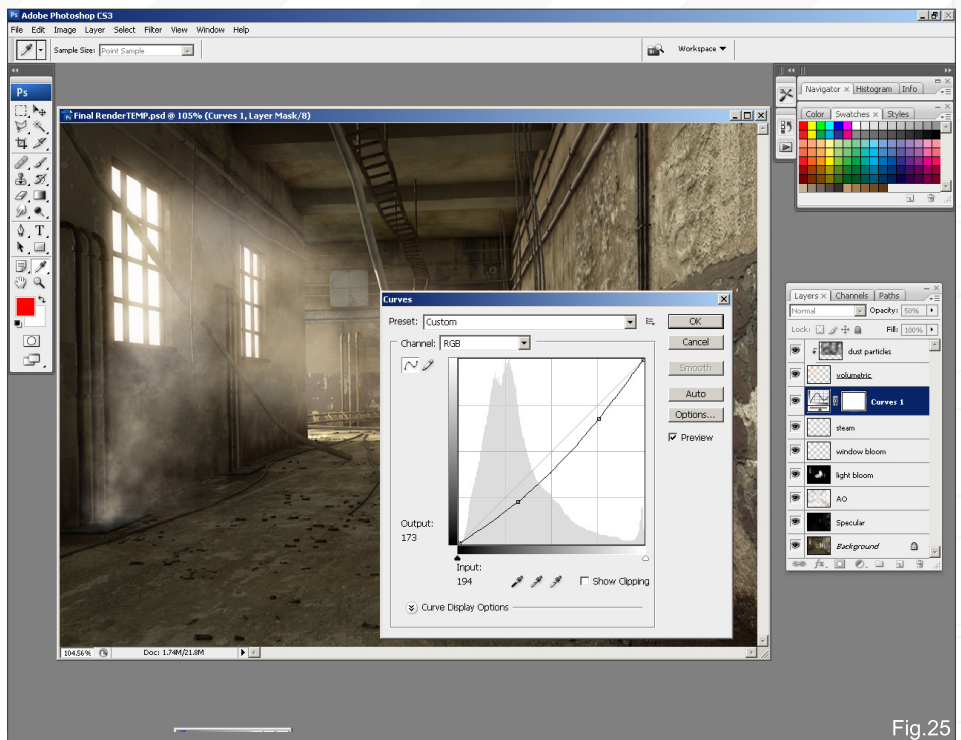


Fig.25



Fig.26





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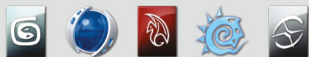
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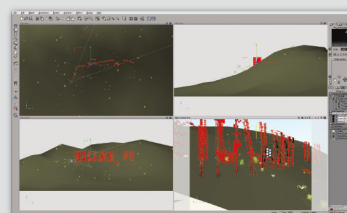
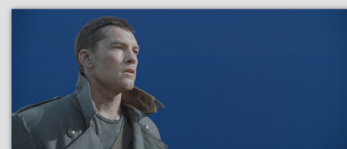
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Concept Art, Digital & Matte Painting Magazine  
Issue 044 August 2009

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Carlos Cabrera



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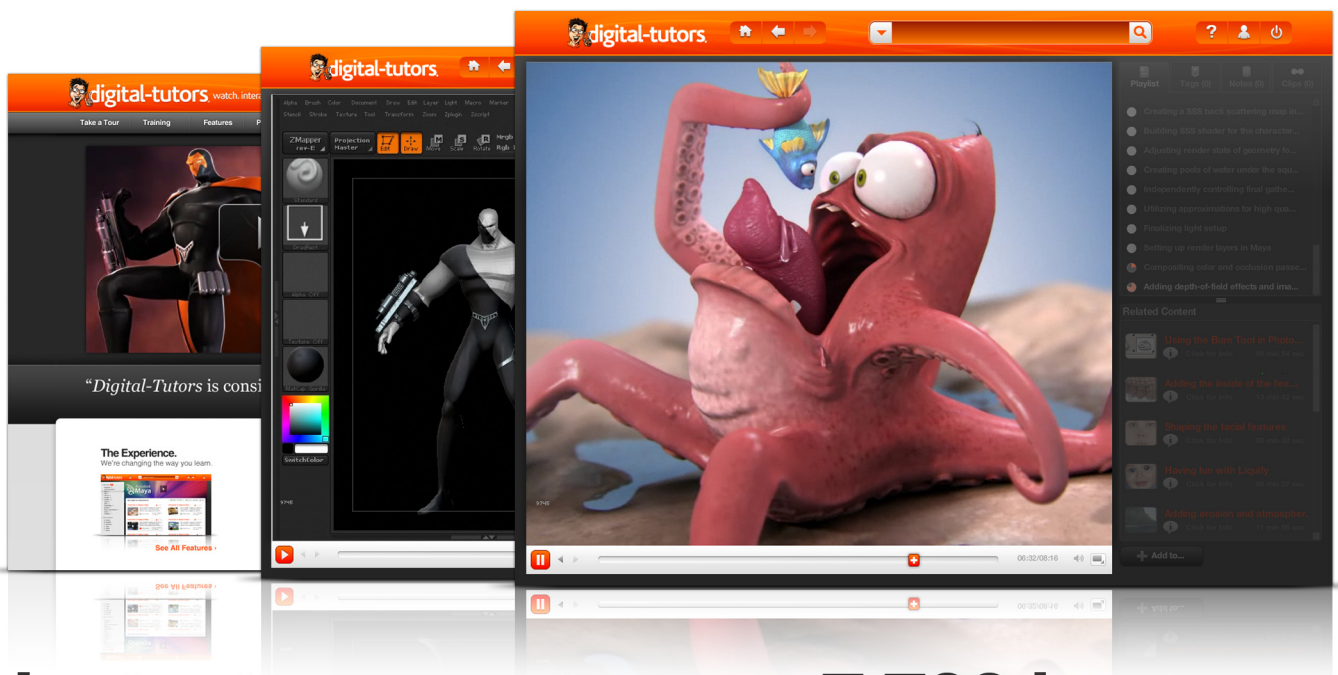






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"I'M LOOKING FOR A MORE  
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THIS DESIGN: STRONG  
IN BUILD, PERHAPS WITH  
A "CRAZY" EXPRESSION  
GOING ON TO DEFINE A  
PERSONALITY AND GIVE  
HIM SOME CHARACTE"

JUNE 2009  
Part 1: Bird-Man

JULY 2009  
Part 2: Mammal-Man

AUGUST 2009  
Part 3: Aquatic-Man

SEPTEMBER 2009  
Part 4: Amphibian-Man

OCTOBER 2009  
Part 5: Insect-Man

NOVEMBER 2009  
Part 6: Reptilian-Man

# Zbrush Manimal

## creation series: part 4 - amphibian man

Welcome to the new ZBrush Manimal Creation tutorial series. Each month we'll see a new artist tackle one of our topics, who will take us step-by-step through the transformation of a generic human head and torso base mesh into a hideous amalgamation of man/creature of 3DCreative's choice! We thought that topics such as a bird, aquatic, and insect would be fantastic for detailed sculpting work – and on top of all this, the artists will texture their models, too, bringing these monstrosities to life. So stay-tuned over the next six months to see what they come up with, and to learn a thing or two about detailed sculpting and texturing in ZBrush.

The forth part of this tutorial series will see **Bruno Melo** cover the development of a **Amphibian Man**. Enjoy!

Download your free  
base mesh and  
metcaps here!





## AMPHIBIAN MAN

**Software Used:** ZBrush & Photoshop

### INTRODUCTION

This month I'm going to be sculpting and texturing an "amphibian-man", so I will need to sculpt a mutant with aspects of both amphibians and humans, and then proceed to texture it in the final stages of this tutorial. I'll be taking you through my creative process when creating characters in ZBrush, guiding you through the stages, enabling you to create your very own amphibian-man. You'll hopefully pick up some tips and tricks along the way as well, so let's begin without further ado!

### CONCEPT

Whenever I start a new project I begin by doing research on the brief that I have been given, looking for references, information, and inspiration – anything that will help me to come up with an interesting concept.

With this I mind, I begin my amphibian-man project by searching for photographic references of different types of amphibians – mostly toads and frogs – to familiarize myself with some classic characteristics of these amphibious



Fig.02



Fig.03

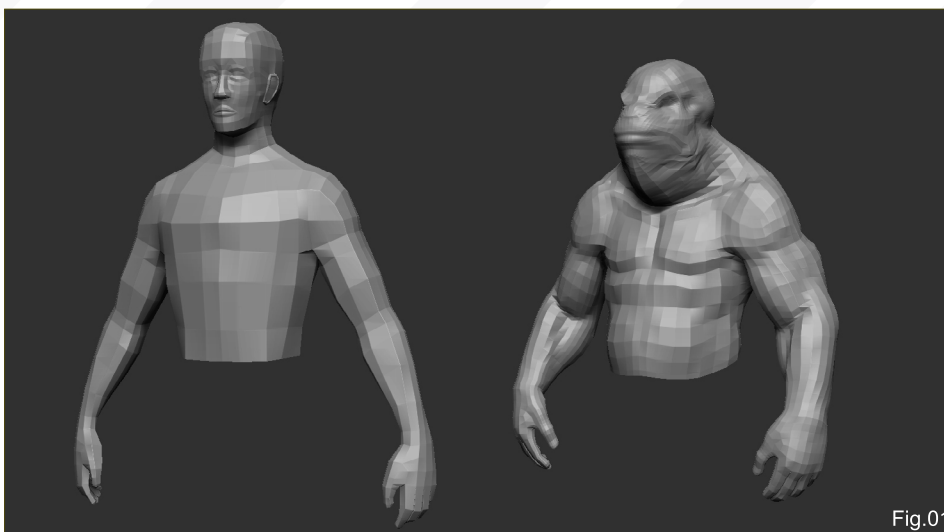


Fig.01

creatures, allowing me to work out in my mind the kind of features my guy is going to adopt.

I've chosen to combine the characteristics of a toad with that of the human, but I want to keep a lot of the male anatomy in my creature this time and concentrate on adding the primary amphibious design to his head, focusing on the mouth, as well detailing the skin texture of the whole design to give it that toad-like feel.

### BLOCKING-IN

I'm looking for a more stylized creature with this design: strong in build, perhaps with a "crazy" expression going on to define a personality and give him some character.

So with the concept forming in my mind, the first thing I want to do is to start the model off by taking the base mesh (free with this tutorial – click on the **Free Resources** icon to download), turning the symmetry on (Transform > Activate Symmetry), and blocking in the main shapes and forms (subdivision levels 1-2) whilst remembering that I want to build a tough guy with muscles and a strong body. I use the Clay and Standard brushes for this work – these are great for building up the volumes, and then the Move brush is particularly useful when it comes to working out the correct proportions. I'm working in the first level of subdivision here (Fig.01).

With the overall form established, I've decided to go for an open-mouthed character, as this gives him much better expression. To do this, I subdivide again, to level 3 this time, and I rework the mouth area using the Standard, Move and Clay brushes (Standard is used for the overall sculpting, the Move brush helps to move the geometry, and the Clay brush can achieve a better shape, for example on the lips). In this case, it's better to rework the mouth area, because if I try to open up the mouth, using something like Transpose or the Move brush, I'll end up with a low mesh resolution inside the mouth, which can of course be a problem because with a low resolution mesh (to check if you have a low number of polygons in areas, turn on the Wireframe for a better view) I won't have a good enough amount of polygons for the detail work in the last level of subdivision (Fig.02).

### SCULPTING

Satisfied with the basic form of my character after the block-in, I continue work at subdivision level 3 with the Standard, Clay and Inflat brushes. This time, I start by using the Inflat brush to get nice muscle definition, and then continue to define the main muscles and adjust the overall volumes (Fig.03). I'm still not worrying about the details yet, as we should remember that our goal is to work out good shapes and volumes before detailing – the detailing comes later!



To give the character some eyes, I first of all select Sphere3D from the Tool palette and make a Polymesh copy (hit the Make Polymesh3D button). I append the sphere to my model and using the Transpose function (Move and Scale) I simply adjust the size and position of the sphere as appropriate. And then the SubTool Master Plugin comes in handy ([www.pixologic.com/zbrush/downloadcenter/zplugins](http://www.pixologic.com/zbrush/downloadcenter/zplugins)) – I just click on Mirror to copy the eye across to the other side (**Fig.04**).

I subdivide the model a few more times now (to level 4 or 5), and start applying more details, working on the muscle definition, cartilage, and deformations, using the Standard (with alphas like Alpha 01 and Alpha 35) and Inflat brushes. The Inflat brush is awesome to use when sculpting muscles because its brush properties help to make the character more believable and solid.

Happy with how things are looking I now want to change and try out some different materials to see how things are looking when other shaders are applied (**Fig.05**).

When sculpting, I like to isolate some areas and work with just sections of my model, such as the head and the hands, when necessary. This just makes it easier to work on the details and gives me the chance to get a better look at certain parts – in this case the head (**Fig.06**). Remember that we're constantly searching for good overall shape and volume in our models.

I also use the Standard brush (with Alpha 35 and 37) to start the skin detailing on the eyebrows here – later on I'll use the Spray Stroke to get better skin detail, but only in the final sculpting stage.

When working on hands in ZBrush, I always sculpt just one isolated hand only, and then simply project all the details onto the opposite hand. To do this, I create a mask over the hand to isolate it (Masking > HidePt) so that



Fig.04



Fig.05



Fig.06



I can sculpt with more control (**Fig.07**). I'm not worrying about adding final details to the hands yet, I just want to define them to get better volume and some of the main details established.

With the one hand done, I reveal the rest of the model that was hidden previously (Shift + Ctrl and click off the model to show all), create a mask over the sculpted hand, and go to Tools > Deformation. I hit Smart ReSym which then projects the details of the defined hand onto the other (**Fig.08**).

Time for the teeth now, which are actually much simpler than they look! I start off by creating a mask over the lip area (just hold down Ctrl to paint the mask), so I can sculpt without affecting other parts of the model. I use the Standard brush to sculpt, always with a low intensity, the Move brush to help me to adjust the size of them, and I also add the Pinch brush to my tool belt this time to achieve a better connection between each tooth and the flesh that it "sits" in. Finally, I use the Inflat brush with a very low value between each tooth to give more volume to the gums (**Fig.09**).

I've decided to go a little off-topic here and create some accessories for my guy to beef



Fig.07



Fig.08



Fig.09



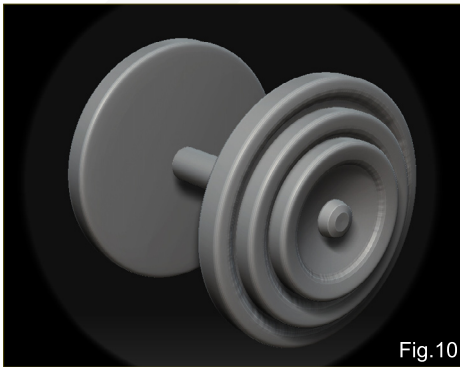


Fig.10

up this character design. I thought this would make an interesting addition when it comes to compositing the character. Aiming for a body-builder look to my final design, I build a dumbbell – which is actually very easy to make. I use Cylinder3D, and with the Transpose function I can manipulate the cylinder into all the different cylinder shapes that build up a classic dumbbell design. I can then append each cylinder to form a single tool by going to SubTool > Append (select each cylinder) (Fig.10).

To get a good pose I of course use the Transpose function, but first of all I need to create a new layer to work on (Tool > Layers > New) for the pose, and I'll explain why I do this later. It's also very important to step back a number of subdivision levels to make better deformation without too many wrong deformations. With the Transpose Mask feature

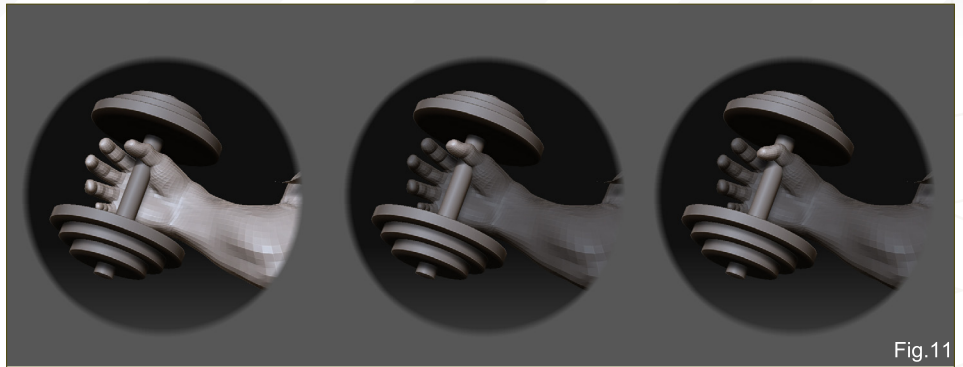


Fig.11

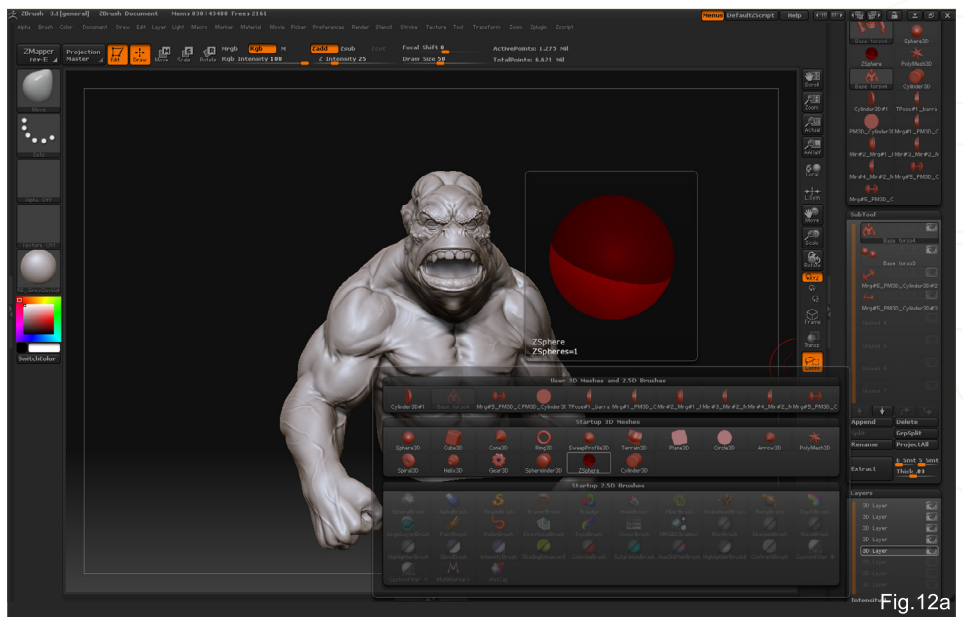


Fig.12a

(just hold down Ctrl and click-and-hold on the model; the mask will be created following the cursor direction. If you want to mask the entire model minus one finger, hold Ctrl and click-and-hold on the hand, and then go to the finger – the

mask will follow the cursor). I can use Rotate for the deformations and then use the Move brush to make the final adjustments (Fig.11).

Moving back to the head now, I need to add a tongue, so I want to append a ZSphere (Fig.12a). I turn off the perspective view and start to create the new mesh. To make a ZSphere turn into a mesh, go to Adaptive Skin > Make Adaptive Skin. I can now subdivide and start the sculpting work on the tongue, using the Standard brush to define the model and the Move brush for better adjustments and placement in the mouth (Fig.12b).

For the final details I use the Standard brush with a thin alpha, like Alpha 35-39, and the Inflat brush. I also start to incorporate more skin alphas of human skin, pores, and so on using different strokes: Spray Stroke with low values to get nice pores and a slight "noise" effect over

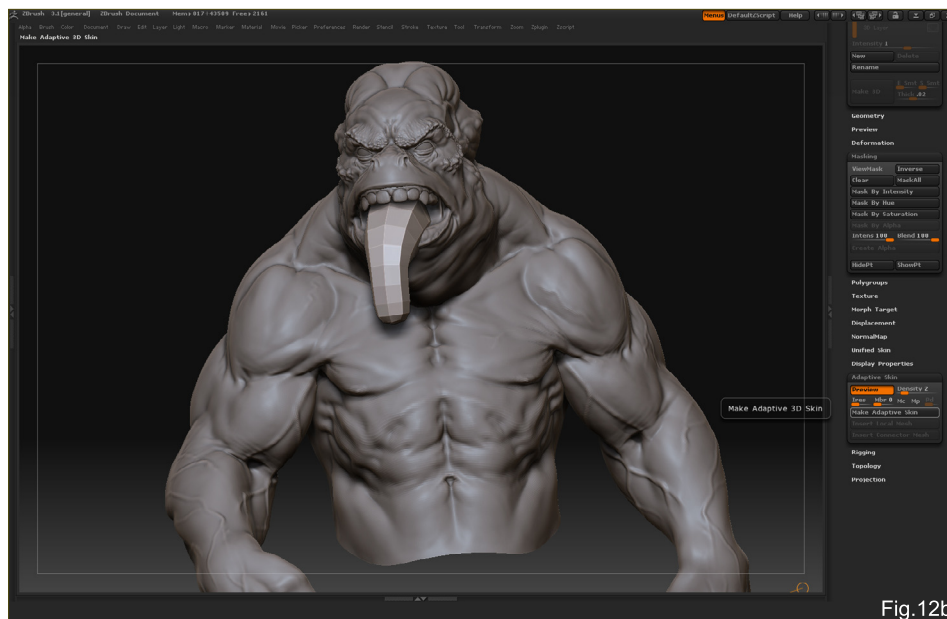


Fig.12b



the sculpt (especially on the tongue). A "pore alpha" can help with this, or you can simply use Alpha 07 instead. DragRect and DragDot strokes with a more defined alpha, like alpha 22 or 59 for example, can give some nice details with more control, without the randomized effect of the Spray Stroke (**Fig.13**).

You can get many alpha packs on [www.pixologic.com](http://www.pixologic.com), which will help you to build up the character's credibility as a half human-half animal.

And here is the final sculpt (**Fig.14**).

## TEXTURING

Moving onto the texturing work now, I make a rough base color over the entire sculpt (Menu > Color > Fill Object), and then define some of the warmer tones, such as on the chest. To illustrate the thin skin, for example, just change your desired color and give it a lower RGB Intensity. Using the Standard brush with FreeHand stroke I can complete this initial stage without any problems (**Fig.15a**).



Fig.13



Fig.14



Fig.15a



Fig.15b

I turn off the layer that I created for the pose at this point, which I do because this way I can turn the symmetry back on and save some time texturing. I hide the other SubTools now (SubTool > click on the eye to hide it, for example) to concentrate on the main model only. I apply some tonal variation onto the model using the Spray Stroke (with Scale and Color Intensity values kept low) with Alpha 07 (always using a low intensity), mixing the colors as I go (**Fig.15b**).



Getting onto the detailed texturing stage now, I use Spray Stroke, DragRect and the Freehand Stroke to apply the details (using some different alphas like using Spray Stroke with Alpha 07 for a nice “noise” effect, DragRect with Alpha 59, and Alpha 22 to give detail with better size and placement control (**Fig.16**).

A good quick trick to get more detail in ZBrush is to use the cavity mask function (Mask > Mask by Cavity) and paint with a darker color in a very low intensity, or just go to Color > Fill Object and use a dark color (such as a dark grey, for example) with a very low RGB Intensity. Observe that the pose layer is turned on again here as we are now at the final detailing stage and it's very important to make give these details without using symmetry, in order to bring more life to the model (**Fig.17**).

And here is the final textured model (**Fig.18**).

## RENDERING & COMPOSITING

I use this stage of the design process to make my work “pop”, using passes, blending modes, and masks. I shall try now to talk you through my rendering and compositing workflow using ZBrush and Photoshop.

The first step is to configure the light, which is basically just a case of positioning it however you require by clicking and moving the little orange highlighted box (**Fig.19a**).



Fig.18



Fig.16

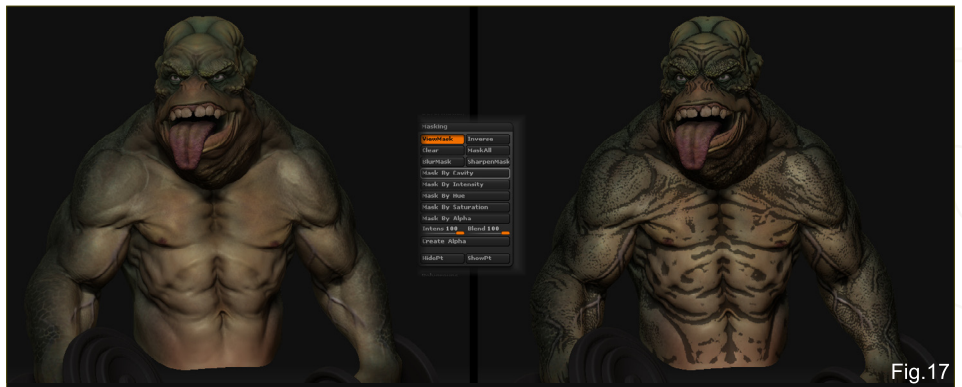


Fig.17

The second step is to configure the main shader which will be used as the base shader. I use GW\_Skincore by Grant Warwick as the main final shader (which can be downloaded by clicking on the **Free Resources** icon, or by going to [www.pixologic.com](http://www.pixologic.com)), but other shaders can be used as well, such as MatCap Skin 04, for example.

I want to make some adjustments now by going to Materials > Modifiers – these adjustments are different for each shader, and are made according to the light (**Fig.19b**).

The third step is to configure the shadows. For this character design I just make some simple shadows adjustments to achieve a “harder” shadow (see **Fig.19a**).



Fig.19a

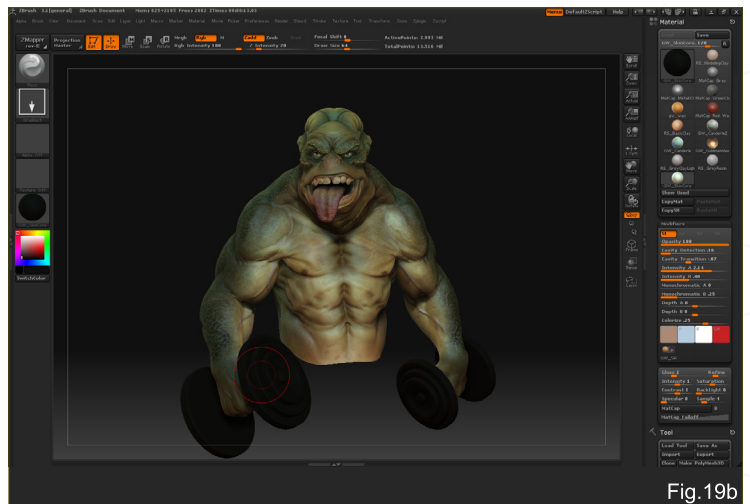
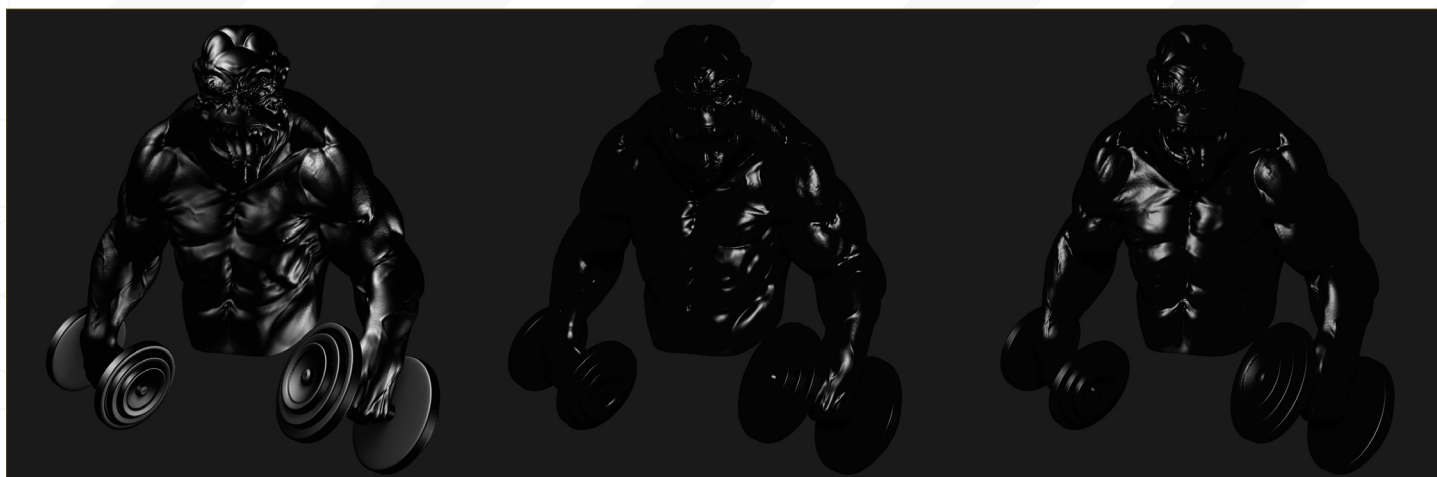


Fig.19b





In the Render menu now, I change the Antialiasing to 2 to get a better render quality when rendering my passes. The other shaders used as passes for the final render composite in Photoshop are as follows:

- **Specular passes** – I use a simple shader – the Toy Plastic shader, for example – and modifier to show only the specular. The other specular passes use the same shader but I change the Light direction and the Specular Curve. ZBrush produces too much specular over the entire model, so I use masks to remove some specular in some areas, and a low opacity (around 10-20%). Layer blend mode: Lighten (**Fig.20a**)

- **Reflection pass** – This is just the ReflectedMap material used to fake a reflection pass. I use this pass with different values for the body, the tongue and the



Fig.20c



Fig.20b

dumbbells. Layer blend mode: Lighten/Color (**Fig.20b**)

- **Color pass** – Flat Color Material – With this pass I have more color control in Photoshop.

For this example I use Hue/Saturation to make it more reddish, and use it to achieve a nice skin tone on the chest. Layer blend mode: Color/Lighten (**Fig.20c**)



- **Occlusion pass** – MatCap White pass without any texture. Layer blend mode: Multiply (around 40-60% Opacity) (**Fig.20d**)

- **Mask pass** – Flat Color Material again – but this time with a different color for each SubTool (using Color > Fill Color) – can be used to pick masks in Photoshop (using Select > Color Range in Photoshop). With these masks I can control the passes by element; for example, I duplicate the Reflection pass and use one for the body with a low opacity, and one with higher opacity for the gym accessories (**Fig.20e**)

- **Main pass** (**Fig.20f**)

I use other Photoshop adjustments, too, such as Color Balance, Sharpen, Levels, Contrast ... It may look like it took a lot of time to achieve the final composite, but the entire compositing step was done in around 30-50 minutes only. And here the final result (**Fig.21**).

## CONCLUSION

Hopefully I have succeeded in walking you through my workflow, and have explained the process in enough detail for you to now create your very own half man-half creature mutant. I hope you've found the tutorial useful. Please feel free to contact me by email should you have any questions.



Fig.20e



Fig.20d

**Note from the Editor:** Grant Warwick has provided us with the **GW\_Skincore MatCap** that Bruno Melo has used in this tutorial for our 3DCreative magazine, which you can download

simply by clicking on the **Free Resources** icon. Remember that you can also download the base mesh that Bruno used with this tutorial, too!

You can also follow the creation of Bruno Melo's Bird-Man in the June 2009 Issue of 3DCreative Magazine! Back issues are available at: [www.3dcreativemag.com/issues.htm](http://www.3dcreativemag.com/issues.htm)

## BRUNO MELO

For more from this artist visit <http://bmelo.cgsociety.org/gallery/> or contact [bmmsouza@gmail.com](mailto:bmmsouza@gmail.com)



Fig.20f

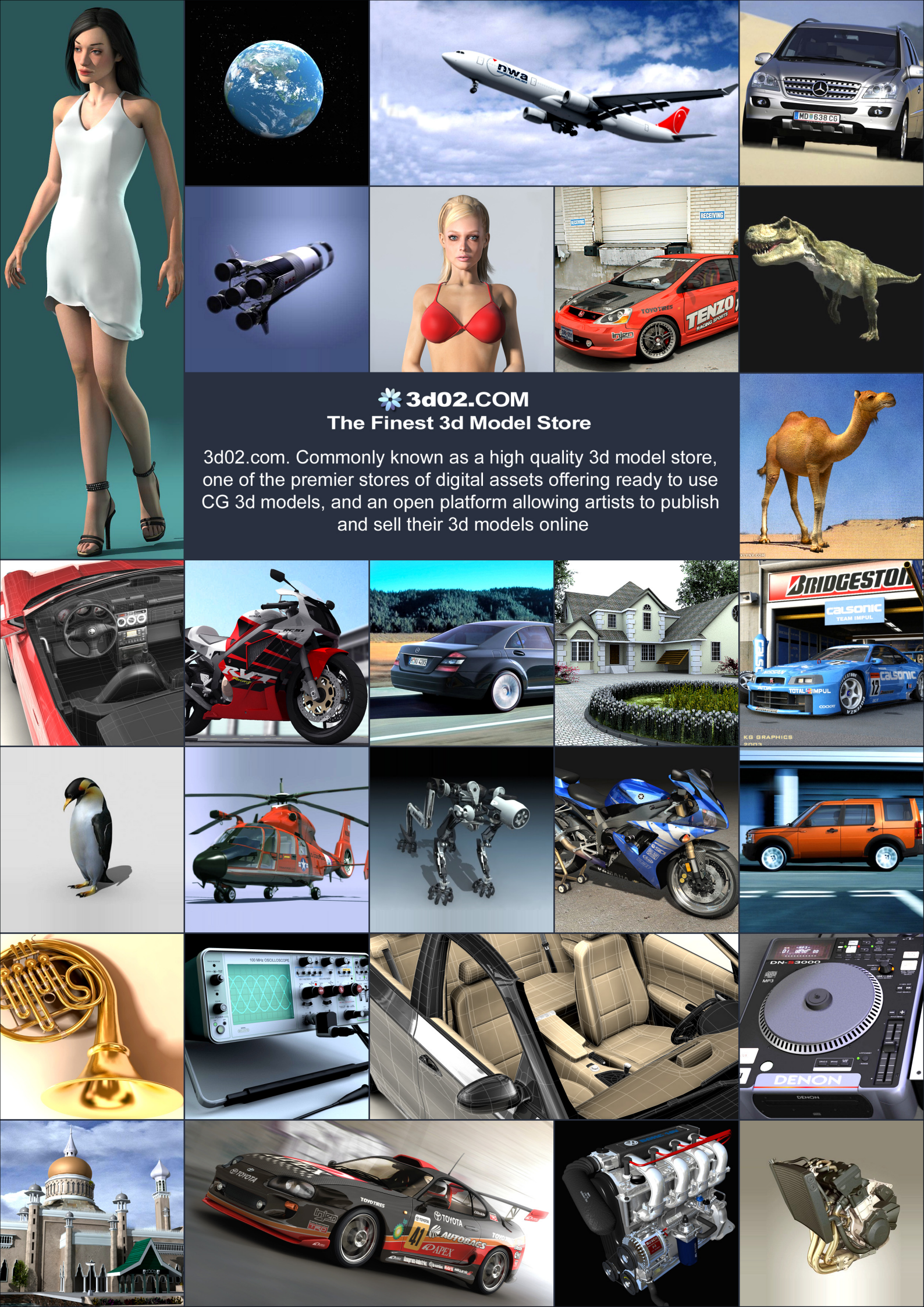






Fig.21





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"WHEN THE BUMP MAP IS APPLIED TO THE BARREL YOU CAN SEE WHAT DIFFERENCE THIS MAKES. SMALLER VOLUME DETAIL SUCH AS THE METAL STUDS, WOOD GRAIN AND EVEN THE BRICKWORK AND MORTAR CAN BE REPRESENTED WELL BY A BUMP MAP, AS LONG AS THE CAMERA DOES NOT GET RIGHT UP CLOSE."

This series of three tutorials will take as its starting point a simple 3d scene with a limited number of objects and a low to intermediate amount of geometry and show how from a library of photos, custom textures can be created in Photoshop. All of the reference images will be taken from 3dTotal's Total Texture collections and form the foundation of the exercise. We shall show how numerous images can be combined and fused into unique templates and be used to describe a variety of materials and create the illusion of detail and volume as opposed to using actual geometry.

CHAPTER 1 | AUG 09

CHAPTER 2 | SEP 09

The second installment will look at the value of bump and specular maps, and also show how "overlay" maps can be used to help disguise problems associated with tiling textures.

CHAPTER 3 | OCT 09



DOWNLOAD HERE!

The texture used within this tutorial from the Total Texture Collection



## CHAPTER 2

Software Used: Photoshop

## THE BARREL

At the end of the last tutorial we dealt with building a brick arch, and we will now continue with the barrel.

In **Fig.01** you can see the section of wood used for the top with a white circle that represents the wireframe export/outer edge. This will also benefit from some subtle shading around the edge, similar to the drop shadow under the metal strips. The best way to achieve this is by using the Circular Marquee Tool and creating a selection area that matches it. Now go to Edit > Stroke, select black for the Color, choose Center, and set the Width between two and four pixels. This will add a black line, and with a little Gaussian Blur and set to Multiply at around 60% Opacity, it will form a good shadow around the rim.

One remaining detail that is yet to be added is the plug in the side of the barrel. This will be made on a separate layer and will comprise of a circular selection area into which we will paste the same metal that was used for aging the metal sections earlier. To give this a sense of volume we will apply a Layer Style once more, in the form of a Bevel and Emboss and Drop Shadow (**Fig.02**).

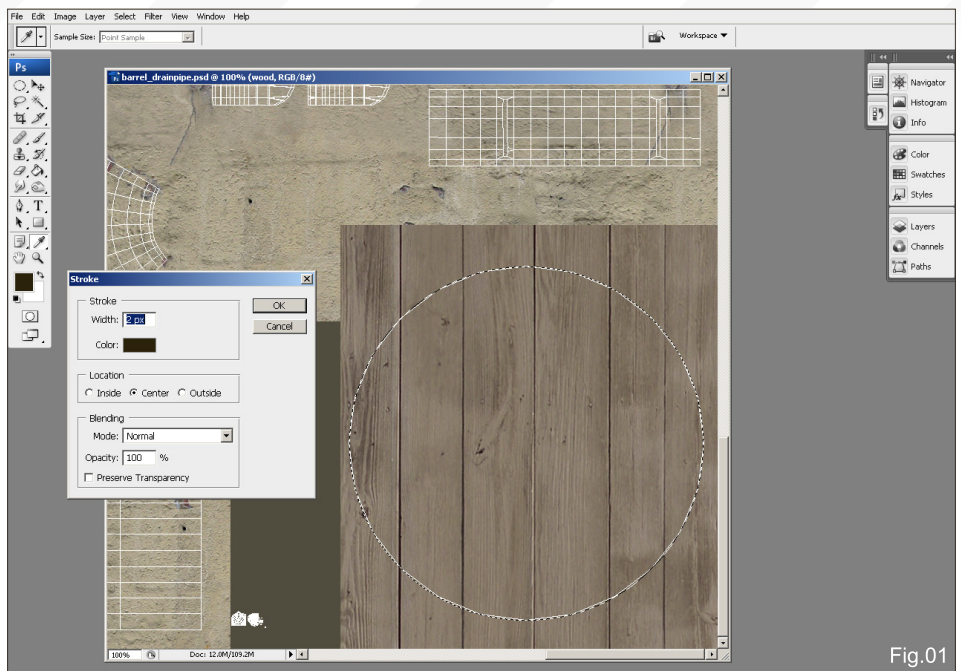


Fig.01

I have altered the brightness and contrast to make it look less rusty, but you will also notice that it is slightly squashed. This is because when it was mapped onto the geometry I saw that it was distorted, so I simply scaled it horizontally until it looked correct in the render. You can do it this way, or you can alter the UV co-ordinates, depending on which is the easiest option for you.

## BUMP MAPS

This concludes all the detail necessary for creating the bump map, as dirt and staining etc. is not relevant because it has no depth on the object itself.

To create the bump map, first remove all detail that does not actually affect the volume of the object. These are:

- Layer Styles, as these represent lighting effects and as such are without volume
- Stains and overlays that just affect color

In **Fig.03** you can see that the wood and metal overlays have been switched off along with the Layer Styles on the plug and studs (these have been made lighter so they are visible). These four components are the key layers we require, but the metal, studs and plug can be a flat color and so are simple to convert.

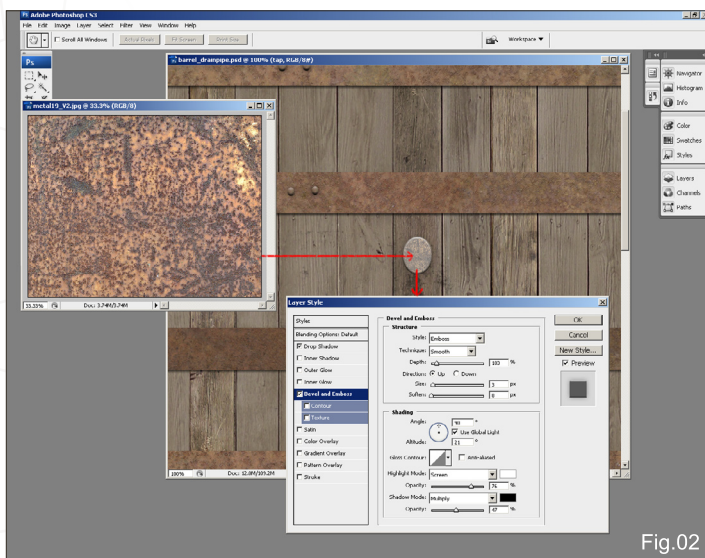


Fig.02

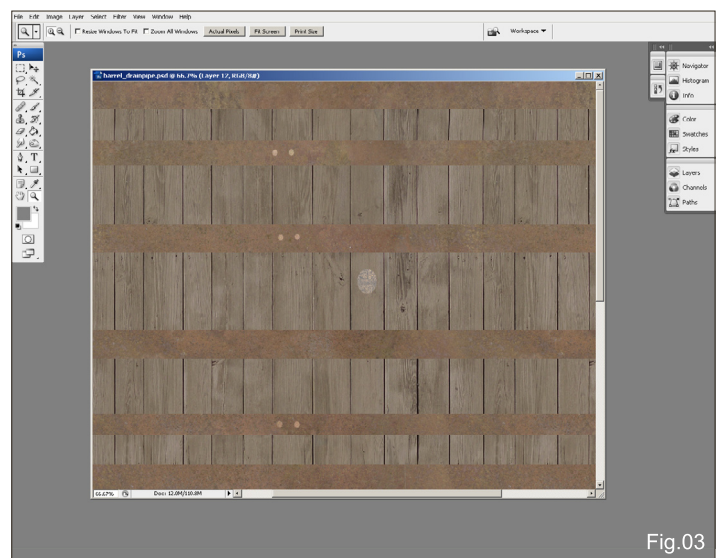


Fig.03



To do this go to Filter > Other > High Pass and ramp down the value until you have a pure grey.

Bump maps use grayscale values to determine depth; the darker the color the more it recedes, and vice versa. Therefore, after applying the filter, alter the brightness accordingly (**Fig.04**).

Next is the wood, which is a little less straightforward. Some people simply desaturate the layer and then alter the Curves to create the bump map, but I find it is more effective to use Select > Color Range to do it in stages.

Use the sampler and select one of the darkest areas (see the red circle in **Fig.05**). Now alter the Fuzziness value until you contain similar values across the layer. Desaturate the selection and apply the High Pass Filter.

Now invert the selection area and do the same thing again. Once done, you will have something similar to **Fig.06**, but if you feel that some of the wood grain is too noticeable simply reduce the contrast or paint over the suspect areas with a semi-opaque gray sampled from the texture.

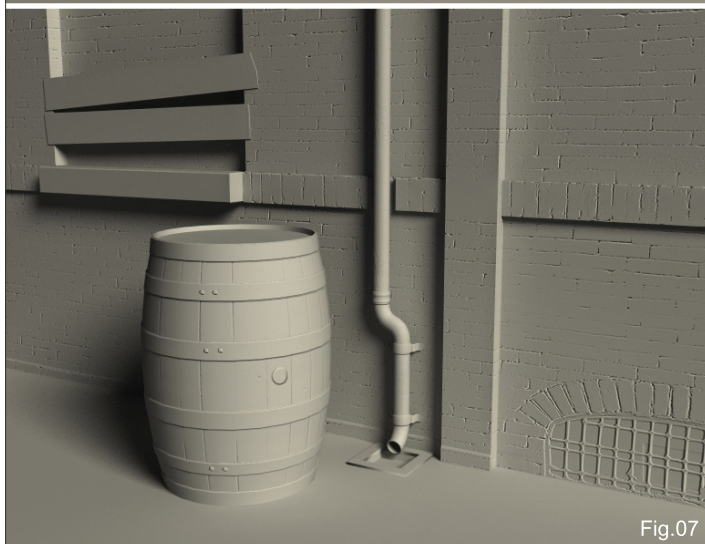
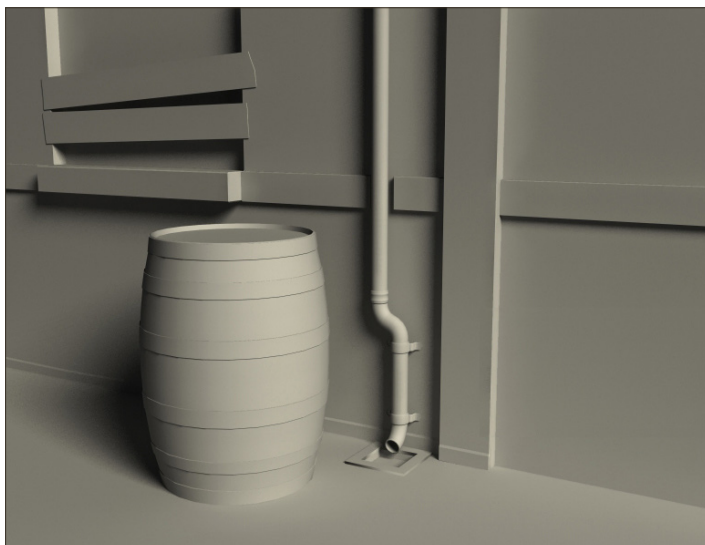


Fig.07

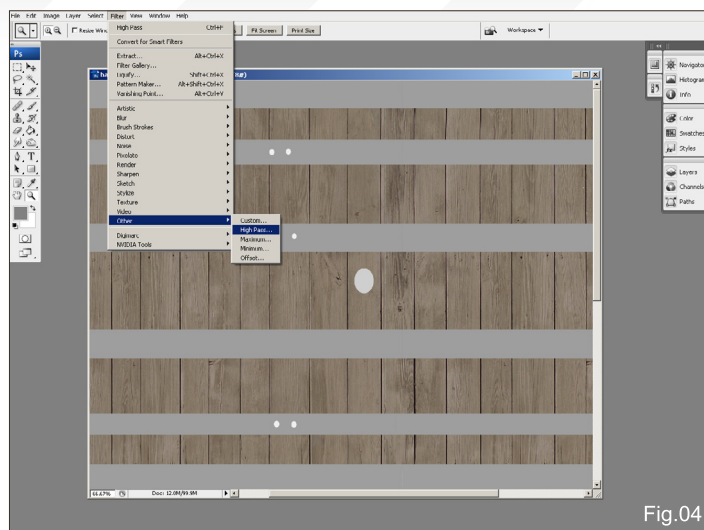


Fig.04

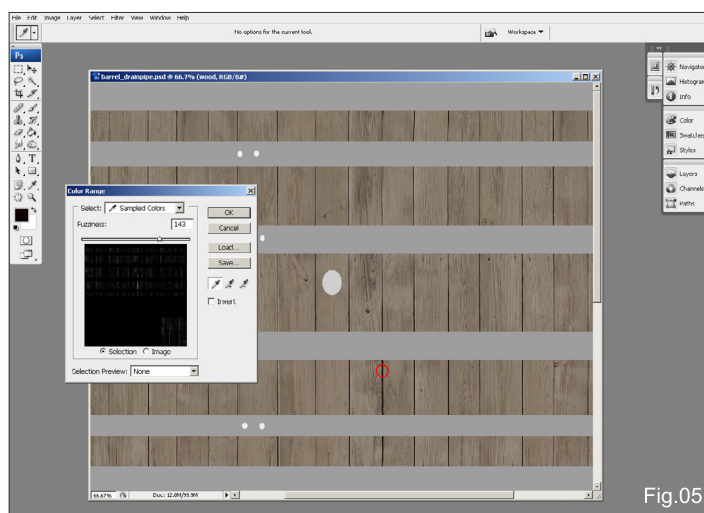


Fig.05

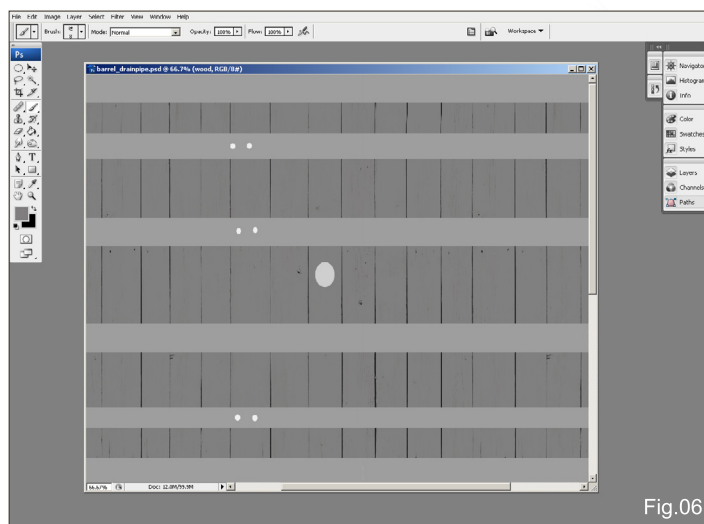


Fig.06

When the bump map is applied to the barrel you can see what difference this makes (**Fig.07**). Smaller volume detail such as the metal studs, wood grain and even the brickwork and mortar can be represented well by a bump map, as long as the camera does not get right up close. In this instance, as the tutorial is concerned with texturing, I have decided to describe the vent through a bump map as it is near the surface of the wall.



## COLOR OVERLAYS

You may remember that the brick texture, once tiled, showed problems relating to repeatable patterns. You could clone and stamp these out using the Clone Stamp Tool, but another effective way is to use an overlay texture.

**Fig.08** shows the brick texture and tiling problems (please ignore the darker band along the top because I altered the brightness to conform to a section that would have been rendered in concrete at one stage).

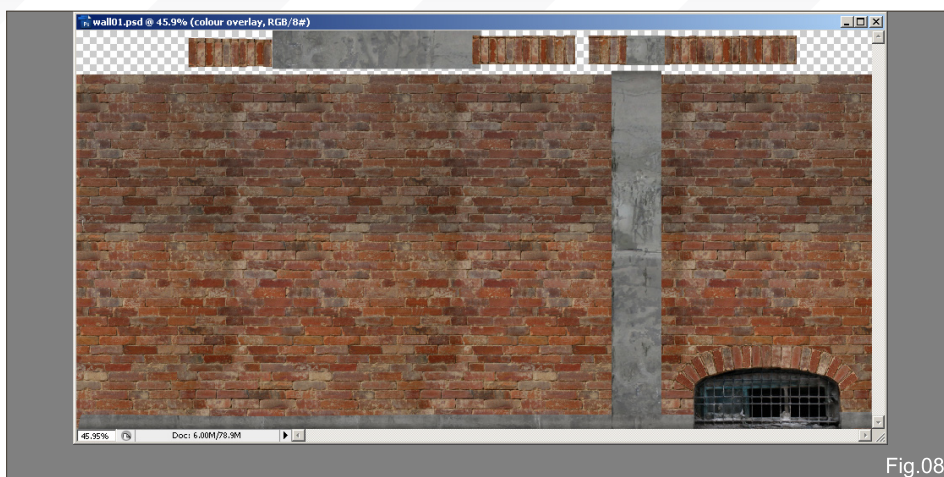


Fig.08



Fig.09

To show that these bricks were once concealed I select the painted section from **brick\_02\_V2** (free with the last chapter of this series) from the Total Textures: Volume 2: R2 – Aged and Stressed DVD ([www.3dtotal.com/textures](http://www.3dtotal.com/textures)), and paste it into the upper section, and will eventually set it to Soft Light 100% (shown in Normal mode in **Fig.09**).

I also use one of the overlay textures (overlay01 – free for download with this chapter, simply click on the **Free Resources** logo) from Total Textures: Volume 1: R2 – General Textures DVD, which I color correct and then set to Soft Light at 63% Opacity. Here it is in Normal mode at 100% (**Fig.10**).

When the two textures are applied you can compare the final result in **Fig.11** with Fig.08. There are still a few problem areas but by following this quick procedure you can add variety to your textures and also reduce the amount of Clone Stamping needed.

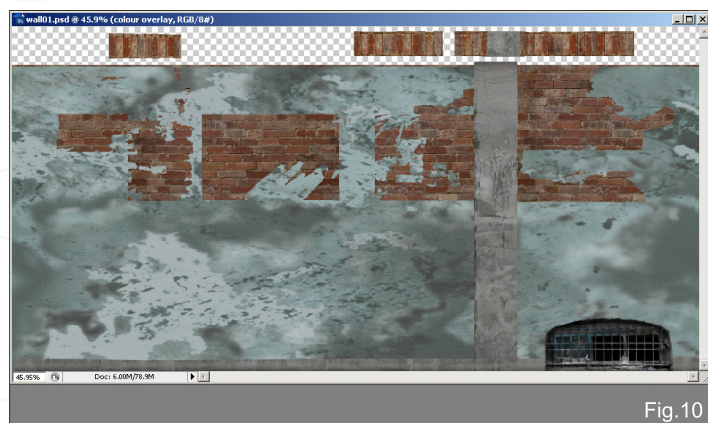


Fig.10

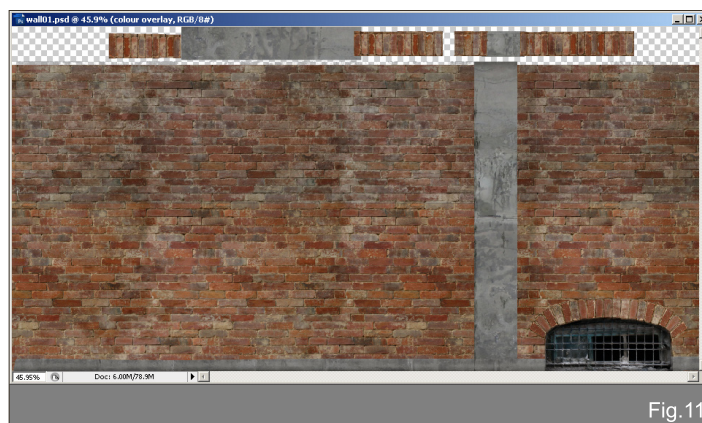


Fig.11



It is also advisable to add all of the elements before you start cloning, because you may well be working on areas that will be hidden – in this case by some concrete render. In **Fig.12** you can see that I have used sections from two textures to create the worn render (misc19\_V2 from the Total Textures: Volume 2: R2 – Aged and Stressed DVD, and window\_06 from the Total Textures: Volume 19 – Damaged and Destroyed DVD – both textures free with the last chapter of this series). I use the Lasso Tool to select an irregular selection area, and then use a textured Eraser Tool to soften the edges and blend it into the brickwork.

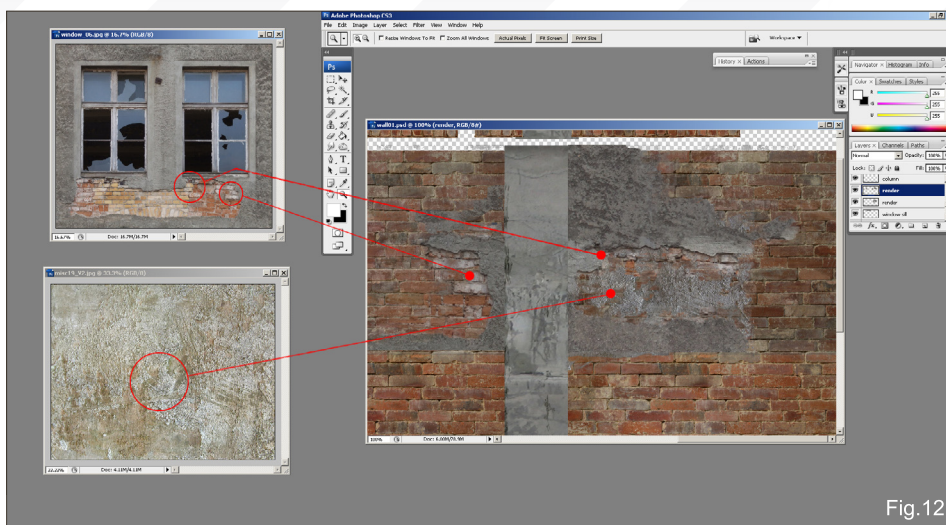


Fig.12

The floor is built up in exactly the same fashion. In **Fig.13** you can see the numerous images that have been used to create the floor and their corresponding layer blending modes and opacities. The layer set to Overlay covers all of the stone and helps relieve the tiling issues, but because the barrel will disguise part of the texture I did not alter it further. I used a section from the vent photo itself to help blend it with the floor plane, and used Select > Color Range to sample the orange tinted areas from stone02\_V2 (free with the last chapter of this series).

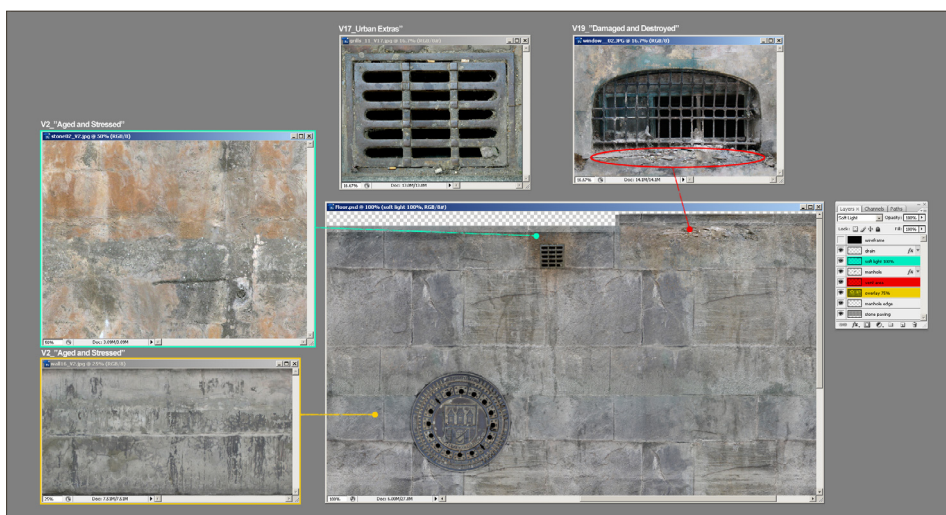


Fig.13



Fig.14

To help set the manhole into the stone I add an Outer Glow Layer Style using the same color as the grout, along with a Drop Shadow. There are a few dark lines painted on a separate layer, called "manhole edge" (seen in the Layers palette in Fig.13), which show some small gaps and cracks around the cut slabs.

**Fig.14** shows the state we are at now, with the render added to the wall along with the corresponding bump map, together with the floor texture. You can see at the moment how the 3D edging at the base of the wall behind the barrel differs from the 2D version left of the vent.

## SPECULAR MAPS

We have seen how effective bump maps can be, but specular maps are of equal importance



and essentially determine the shininess of a surface. These are also grayscale maps with whiter areas showing more specular intensity and reflectivity.

To start the map, first create a new layer and fill it with black (Layer 12 in **Fig.15**), and then place this below all other layers that will be relevant. I have duplicated the wood layer as a precaution (wood copy) and placed this above the black layer.

Now go to Select > Color Range and pick one of the lighter areas, and then alter the Fuzziness value until you have a satisfactory selection (**Fig.16**). You will notice that I have already deleted the wood sections below the metal which are irrelevant.

Click OK and then copy and paste this selection into a new layer and desaturate it. I have called this "specular wood", which you can see above the base black layer in **Fig.17**.

This process can then be repeated for all sections of the texture. It is a good idea to use your PSD file in order that you can mask selections quickly and accurately, for example the details and dirt layers.

In **Fig.18** you will notice that the plug and studs are brighter, as they will reflect more light. You can also see from the Layers palette that the dirt and grime layers (which we will look at in Chapter 3) are also present,

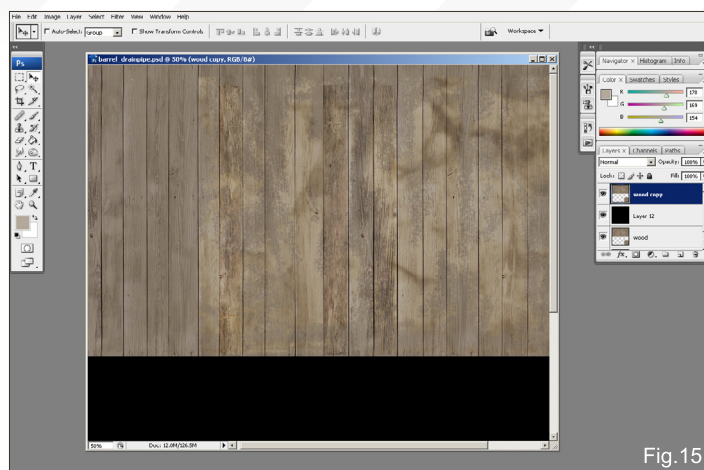


Fig.15

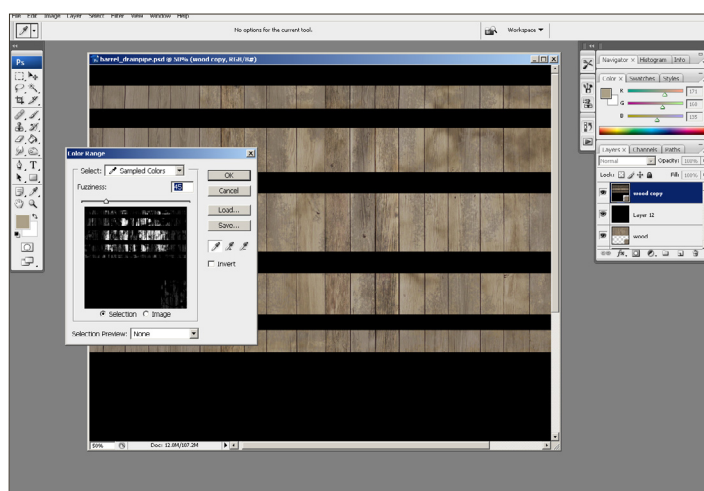


Fig.16

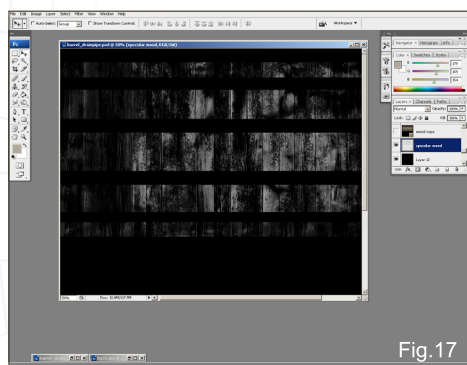


Fig.17

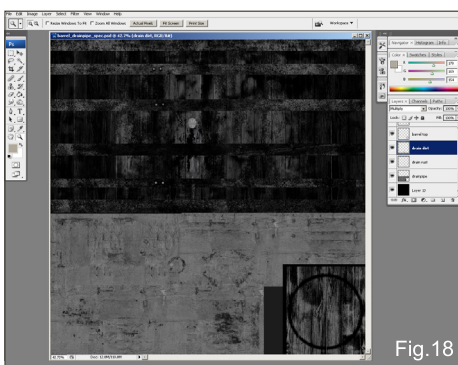


Fig.18

unlike the bump map. This is because these will affect the way light bounces off the materials, so any areas like this should be set to Multiply and retained, for example the drain rust/dirt.

When the specular map is applied you can see the subtle enhancement it creates when compared to just a color and bump map (**Fig.19**). If you need to emphasize the effect, either ramp up the amount in your 3D package or increase the contrast on the map itself.

## CREATING AND SOFTENING EDGES

The less geometry there is in 3D models, the more we need to rely on texturing for detail. I have added a small chamfer to the edges of the concrete column and windowsill in the scene, but because they have no subdivisions they have pure angles with no deviation along the edges. When you are working with a restricted



Fig.19



poly count it is necessary to decide which areas will require more geometry, which in this case is the drainpipe.

In **Fig.20** you can see where the edges appear crisp and show no signs of wear, which does not appear in keeping with the scene. We shall add some highlights to help soften the edges and also put in some chips and cracks to help disguise the straight edges.

To create highlights you can duplicate part of the wireframe guide and then blur it, as this will correspond exactly to the actual edge, or you can add a new layer set to Soft Light and use white to highlight edges.

In **Fig.21** I have added a highlights layer; using a brush I paint in the white lines, which are then blurred.

To help further, some chips have been painted along the left edge of the column, along with some small cracks on the windowsill which I have cloned from one of the concrete render layers (**Fig.22**).

In **Fig.23** you can compare the “before and after” results and see how the painted highlight along the concrete skirting has now integrated this part of

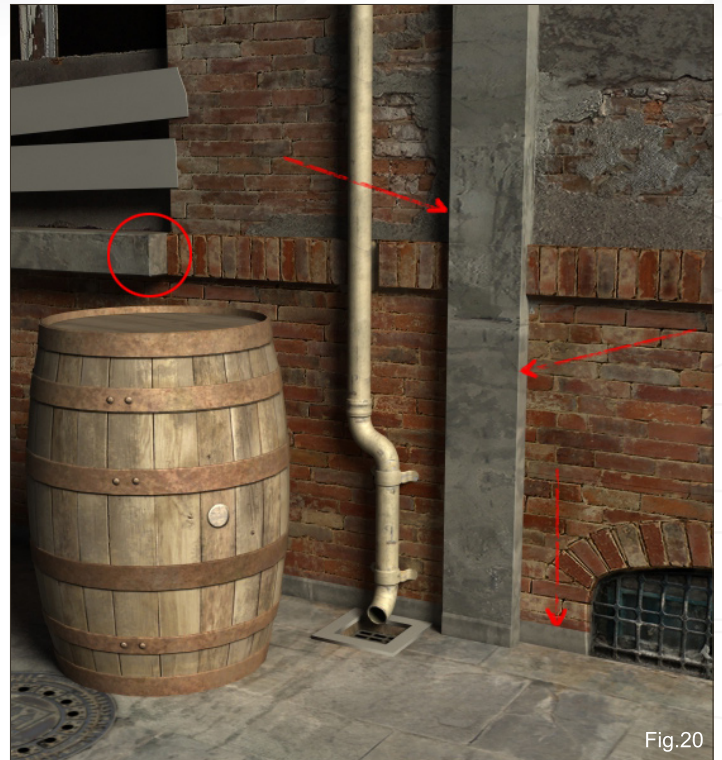


Fig.20

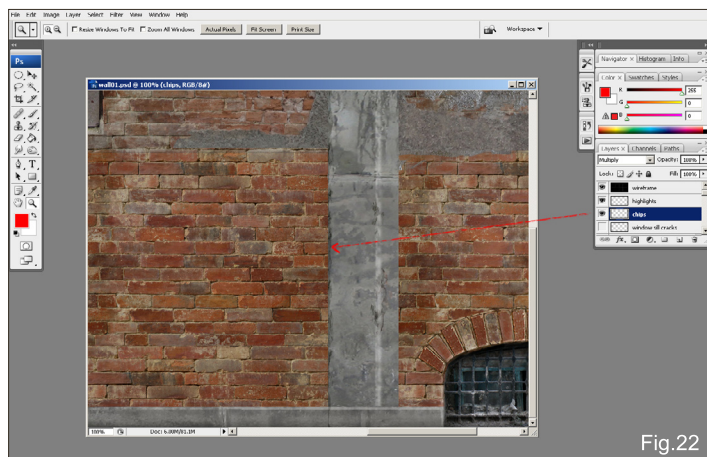


Fig.22

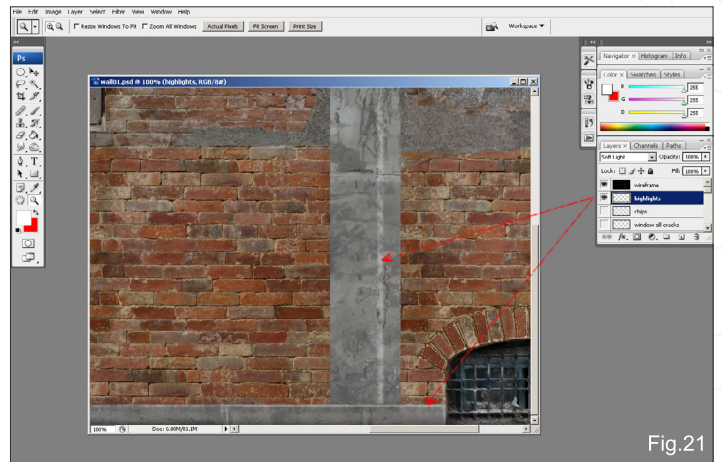


Fig.21



Fig.23

the scene, demonstrating how textured detail can successfully substitute geometry in certain instances.

The painted highlights help to show a more worn edge down the column, and the chips on the windowsill help to disguise the right angles.

And this marks the end of Chapter 2. In the third and final installment we will go on to cover adding in dirt and grime, and show how to weather the scene using dirt maps.

**RICHARD TILBURY**

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<http://www.richardtilburyart.com/>

or contact

rich@3dtotal.com



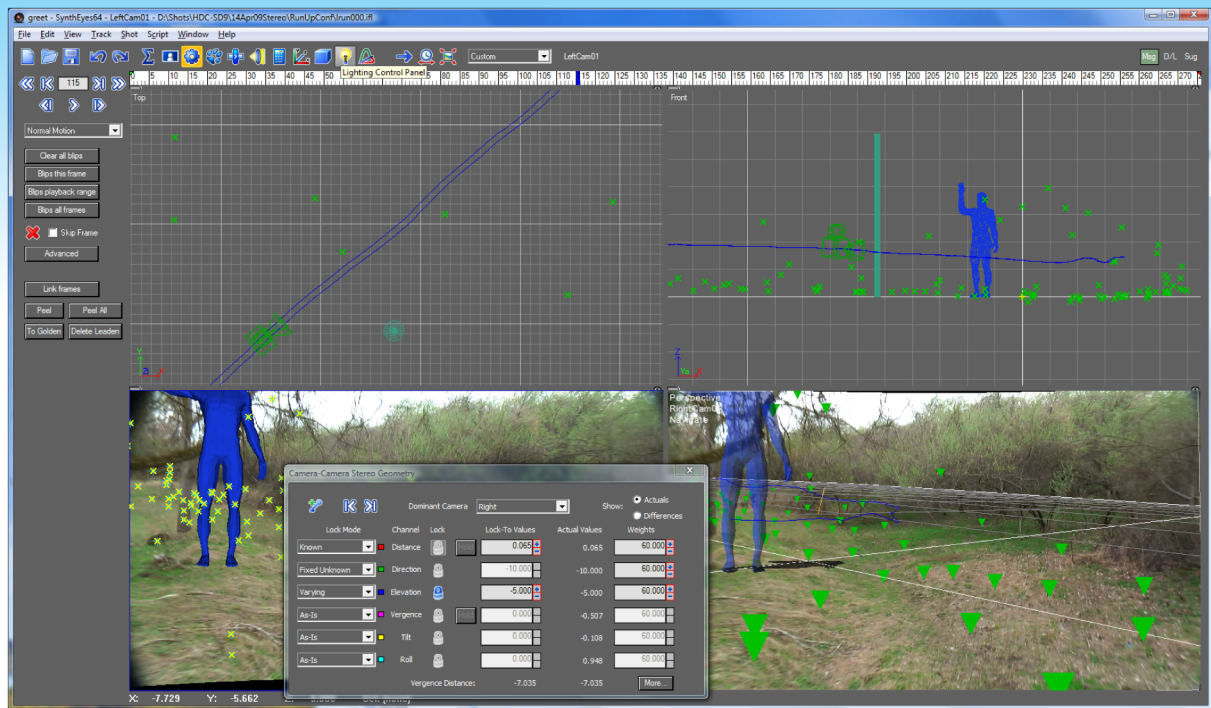




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# Le Rabbit

Making Of by Jose Alves da Silva

We first met Jose Alves da Silva when he had one of his stunning 2D images featured in our 2DArtist magazine, and when we stumbled across this charismatic 3D bunny on the 3DTotol forums, our jaws dropped! We invited Jose to put together a detailed making of article to talk us through the creation of this comical piece, and we are honored to have such an extensive walkthrough for you. We're sure you'll fall in love with not only his rabbit with attitude, but also Jose's attention to detail and applausable compositional tricks. Enjoy!

"AN IMAGE ABOUT A HUMANIZED RABBIT WITH LOTS OF ATTITUDE STARTED FORMING IN MY MIND ... AND WHAT WAS SUPPOSED TO BE A MODELING EXERCISE OF JUST A FEW DAYS ENDED UP BEING A FINISHED PIECE THAT TOOK ME ABOUT TWO MONTHS."

Jose



## MAKING OF "LE RABBIT"

**Created In:** ZBrush, 3ds Max, Unfold3D, and V-Ray

### INTRODUCTION

"Le Rabbit" cannot be described as the result of an extremely well organized and planned process. In most of my personal work I give priority to the "fun factor" and try to keep the whole process really enjoyable. So, I try not to plan everything in detail at the start, and tend to leave a lot of decisions to be made along the way in order to keep all the phases creative.

During the creation of this image I bumped into several problems, especially regarding the fur. I am not a digital hair expert and I had to face some questions for the first time. These problems may sound basic to some readers, but I have decided to talk about them and the way I solved them, because some of you might consider these tips valuable.

Regarding the motivation to create this piece I had wanted to make a more cartoonish character for ages, because this is a type of language with which I feel really comfortable. An image about a humanized rabbit with lots of attitude started forming in my mind ... and what was supposed to be a modeling exercise of just

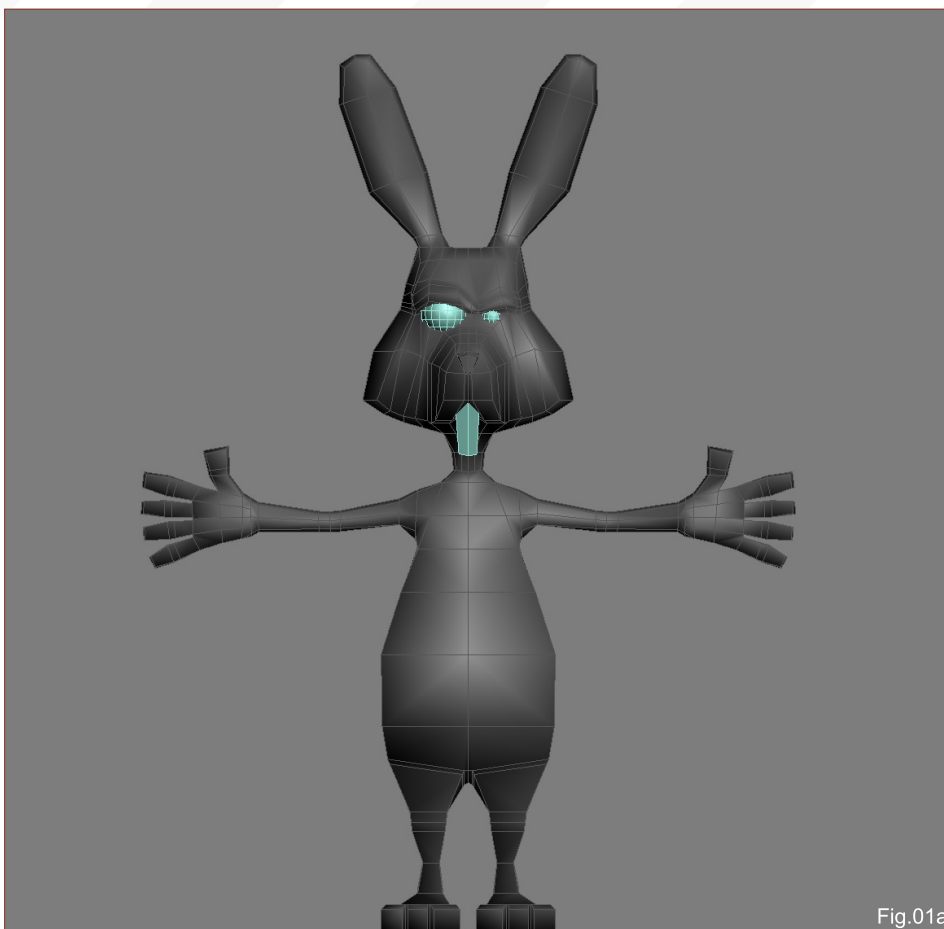


Fig.01a

a few days ended up being a finished piece that took me about two months.

### MODELING

From the beginning I had the intention to sculpt the model in ZBrush. At the time I was not so familiar with ZSpheres and I wanted to make sure that the character had enough detail in certain important areas, like the snout, so I decided to go old school and create a low-poly version of the rabbit with good topology for further detailing in 3ds Max.

**"...IT IS VERY IMPORTANT TO HAVE THE EYEBALLS' GEOMETRY PRESENT WHILE WE MODEL A FACE..."**

I created a box with a few subdivisions and applied the Symmetry Modifier on top, in order to create a mirror axis at the center of the body. I then applied the Edit Poly Modifier below the Symmetry Modifier, and started editing the polygons with "Show end result" turned on so

that I could see all my editing being mirrored, to have a clear idea of the full silhouette.

The usual Edit Poly tools, like Extrude, Chamfer, Connect, etc. were used to create a T-pose version of the character. I created some extra edgeloops around the joints (elbows, neck, wrists, knees, shoulders) so that I could pose him later and have enough polygons to work with in those areas. I also decided to model the fingers individually, rather than just give volume for the hand, so that later I could position the fingers more accurately (**Fig.01a – b**).

One thing that I have learned from previous projects is that it is very important to have the eyeballs' geometry present while we model a face. It is very easy to incorrectly model the area around the eyes, especially the eye socket area and the way the eyelids make contact with the eyeballs. So, I created two spheres in the place of the eyes to guide me. With this particular character, the eyes have different sizes. I did this to emphasize the rabbit's expression and

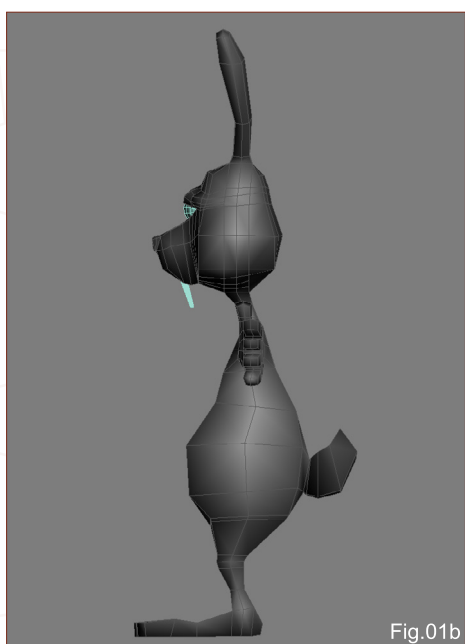


Fig.01b



really exaggerate the lift of the eyebrow. It also contributes to the wacky feeling of the character.

The basic shape of the front teeth and the gums were also created at this stage to help me with the modeling of the snout, and to make sure they fitted well.

## UV MAPPING

Usually it's at this stage that I take care of the UV mapping (**Fig.02**). It is a good time to do it because the geometry is still quite simple and easily identifiable on the UV layout. If you leave it till later you will have to deal with thousands of polygons and the process might not be so simple.

**“...I TOOK THE OPTION OF POSING EACH BODY PART FIRST AND SHAPING ITS ANATOMY LATER.”**

I tried to minimize the distortion of the mapping, as well as keeping as much continuous skin as possible. The advantage of keeping the geometry mapping continuous is the fact that you can paint over large areas without worrying about the continuity of the texture between different parts of the model.

I also kept all the different parts on the UV layout at the same scale. I could have used some more texture space for the head, for example, but then I would have the problem

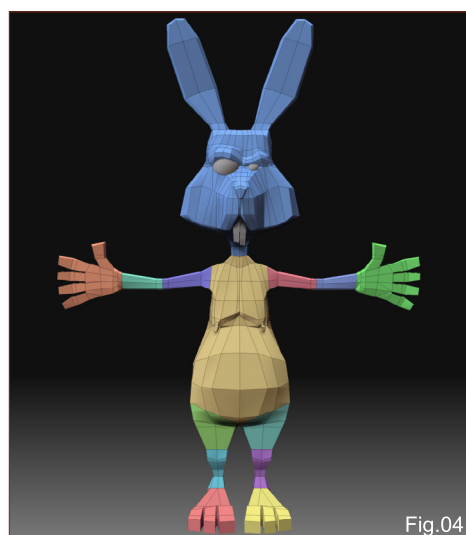


Fig.04

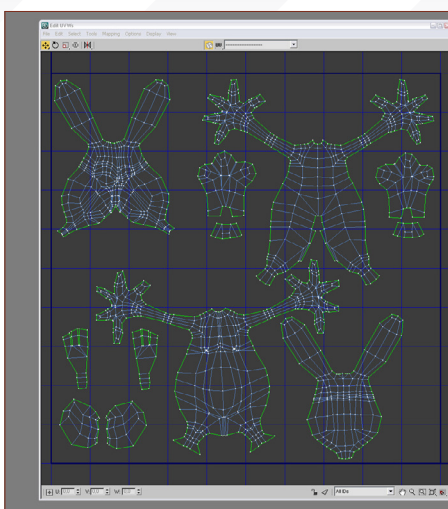


Fig.02

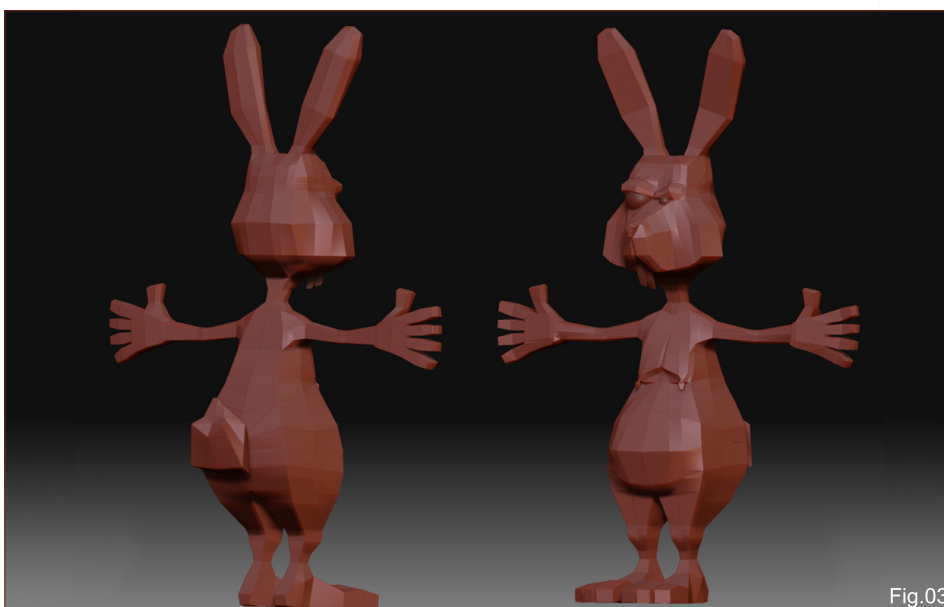


Fig.03

of different pixel scale on different parts of the model. Fortunately, to deal with the continuity problems on the edges of the different parts, I could count on ZAppLink, but we will talk about that later.

For the UV unwrapping I used the Unfold3D application.

## ZBRUSH

After setting the UVs I attached the gums, teeth and eyes to the body mesh and exported it in OBJ format, which was then effortlessly imported into ZBrush (**Fig.03**).

With the mesh inside ZBrush, I used the Tools > Polygroups > Auto Groups option to easily separate all the elements into different

Polygroups. Then in the SubTools menu I have chosen Group Split to automatically place each polygroup into a separate SubTool. This way, the eyes, gums and teeth were stored as individual SubTools.

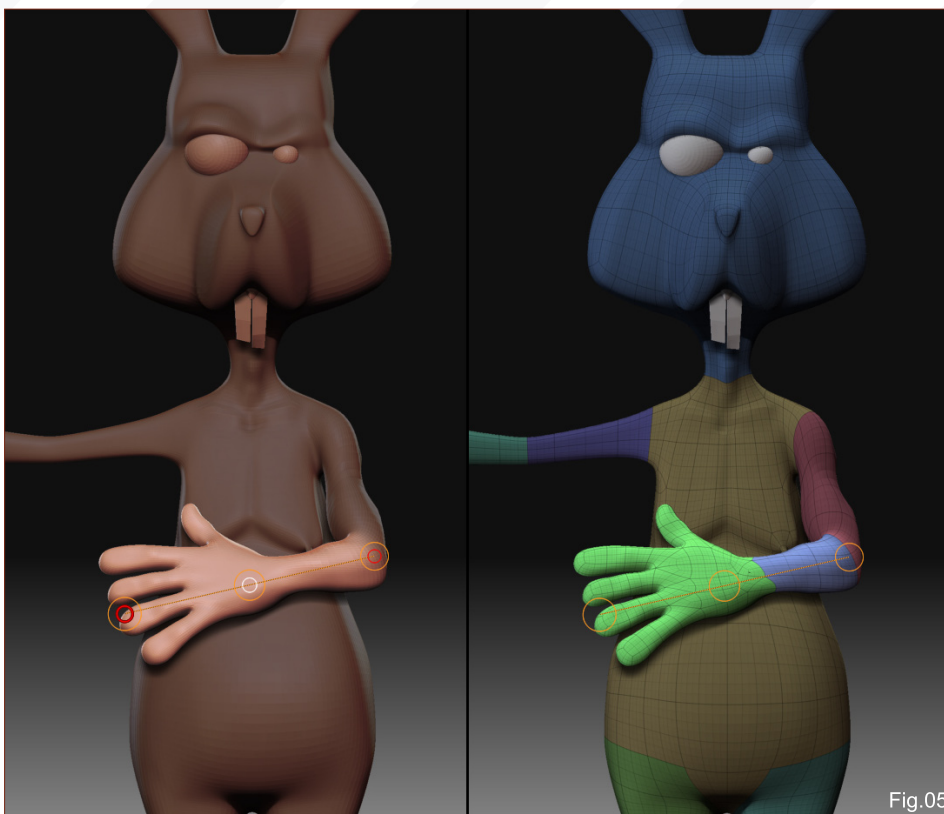
The following step – a very important one – was to define the Polygroups of the main body. By separating the mesh in different groups you can hide/mask parts of the body during the sculpting stage. This allows you to reach inaccessible areas after posing and making selections for transposing a lot quicker. With the model in a T-pose it was very simple to make the selections to define the Polygroups. I defined the polygroups according to the anatomy of the body: head, torso, arms, forearms, hands, thighs, legs and feet (**Fig.04**). Later, for hand



positioning, I also had to separate each individual finger into a Polygroup.

I usually use the Symmetry tool while sculpting for as long as I can, in order to minimize doubling the work in certain parts of the body; however, with this project it was not the case. The pose of the rabbit was my main concern and I wanted his muscles to bulge and shape correctly according to their final position, so I took the option of posing each body part first and shaping its anatomy later.

I used the Transpose tool for all the posing, mainly by masking the part I wanted to position, inverting the mask selection, setting the Transpose Action Line as if it was an actual bone, and rotating it around the joint (**Fig.05**). After rotating, it is common that the joint area doesn't deform exactly as you would like, but a few brushstrokes can usually fix that. The



Polygroup distribution was really handy at this time, allowing for a fast selection.

Regarding the sculpting technique, there was nothing new about it, I mainly used the Move tool for reshaping, the Clay tool for sculpting (I find it more controllable than the Standard brush), the Inflat tool for muscle bulging, the Flatten tool to smooth the surface (I prefer it over the Smooth tool for this purpose), and the Smooth tool for untangling the surface when deformations get ugly – particularly at the inner parts of the joints after transposing, where geometry tends to self-intersect.

I've prepared an image in which you can see the evolution of the sculpting phase (**Fig.06**).

As I have mentioned, my main concern was the pose because it defines the personality of my character. I tried to achieve a natural pose by shifting the character's weight to his left leg and tilting the hip so that his right leg could advance a bit, while keeping both knees locked, resulting in a comfortable standing position. I also tilted the shoulder line and lowered the head in the

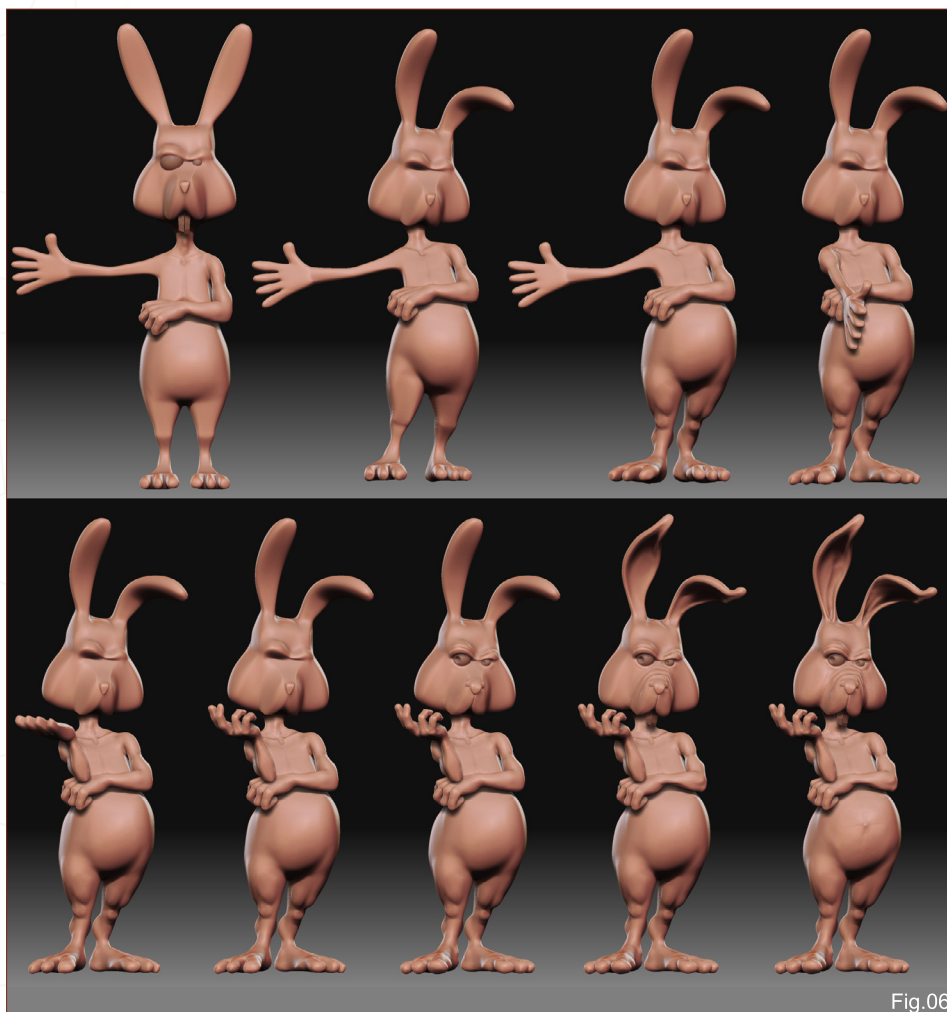






Fig.07

opposite direction, while the eyes keep looking to the side in order to give us “that” look. The raising eyebrow is also emphasized by the ears, as the rabbit’s right ear, above the bigger eye, points up, and the left ear curls down in continuity with the spine curve (**Fig.07**).

The rabbit’s right hand, which will later hold a cigarette, was also positioned with an exaggerated angle backwards – not only to be more expressive, but also to create a negative space between the hand and the cheek so that the silhouette is clear without any overlapping.

## ZAPLINK

All Pixologic’s plugins are worth checking out, but my favorite is definitely ZAppLink (you can download it at [www.pixologic.com/zbrush/downloadcenter/zplugins](http://www.pixologic.com/zbrush/downloadcenter/zplugins)). This plugin projects

the image in ZBrush’s document screen into Photoshop, where you can use all your favorite tools to paint your model and then project the result back to the model texture in ZBrush!

I started by picking a white image with 4096 by 4096 pixels as my model texture. I then activated ZAppLink (under the Document tab) with Photoshop already open in the background. Choose “Drop Now” and Photoshop will pop up with the ZBrush image. The document has a layer order and naming convention that you will have to keep in order for everything to work as expected (**Fig.08**).

Add as many layers and blending modes as you want, as long as in the end you collapse all your painting to a layer with the name “Layer1” with the original mask. Then save the image and go

back to ZBrush, choose Re-enter ZBrush, select Pick up now, and the painting will be applied to your texture. Don’t forget to save the changes to your texture by going to the Texture tab and choosing Export.

To continue painting the model you just have to change your point of view and project the image again through ZAppLink, and keep repeating the process until you’re done. You can even hide

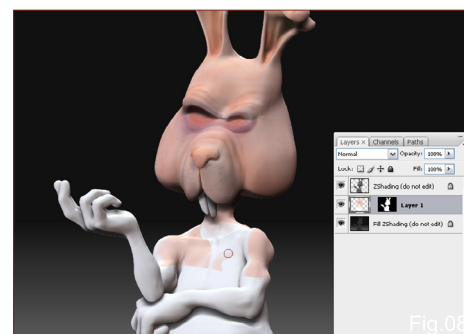


Fig.08



parts of the model before making the projection in order to paint inaccessible areas. This is how I painted the diffuse texture of my character (**Fig.09**). The remaining textures (Specular, Bump, SSS, etc.) were fully painted in Photoshop using the diffuse texture as a base.

**“THE MODEL HAD ABOUT 320,000 POLYGONS AND MY NEW TASK WAS TO COVER IT WITH FUR”**

## THE FUR

I exported the high-poly model in OBJ format and imported it into 3ds Max at this stage. The model had about 320,000 polygons and my new task was to cover it with fur. As you may know, when using the Hair and Fur (WSM) modifier, a hair guide spline will be created for each vertex. By manipulating these guides you will define how the hair will grow, as the software will make an interpolation between the vertex splines in order to create the hair strands in the area between the guides.

However, growing the hair on a 300K poly mesh is not an option. No one wants to deal with 300,000 guides – not to mention that the software will not allow it. The only option is to use a low-poly mesh to grow the hair. So, I exported the mesh from ZBrush at a lower subdivision level with about 5,000 polygons.

Using a lower subdivision mesh brought up another issue: the polygons of the high- and low-poly models were not coincident; some vertices were below the surface of the high



Fig.09

resolution mesh and others were above. Having hair growing in the air at a distance from the high-poly mesh was a problem, but having the hair grow below the surface is actually desirable. As such, I applied a Push modifier with a negative value to the low-poly mesh in order to shrink it below the high-poly surface. I then turned off the Renderable option under the

Object Properties, so that the low-poly mesh didn't render (the hair will render independently from the fact that the mesh will not). I applied the Hair and Fur (WSM) modifier, and the titanic fight for hair control started (**Fig.10**) ...

With this project I found that the best way to control hair is to shorten it drastically and get rid of all the randomizing parameters at the beginning. Here are the steps of how to do this:

- Go to Frizz Parameters and reduce the Frizz Root and Frizz Tip values to zero
- Choose Style Hair and increase the brush size so that it covers the whole model
- Remove the Distance Fade option; pick the Scale option and drag-and-click to the left over your model, until the hair guides are really short

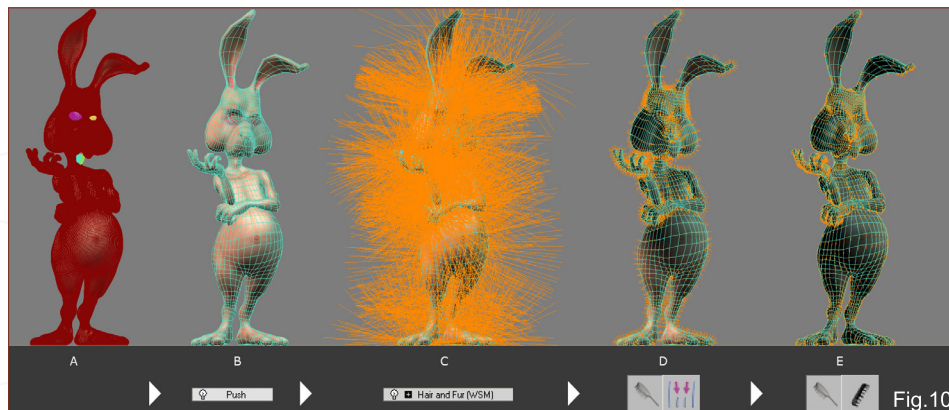


Fig.10

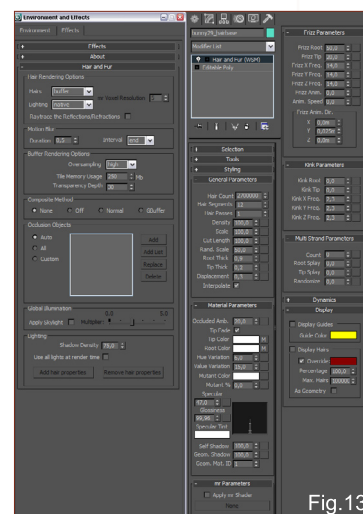
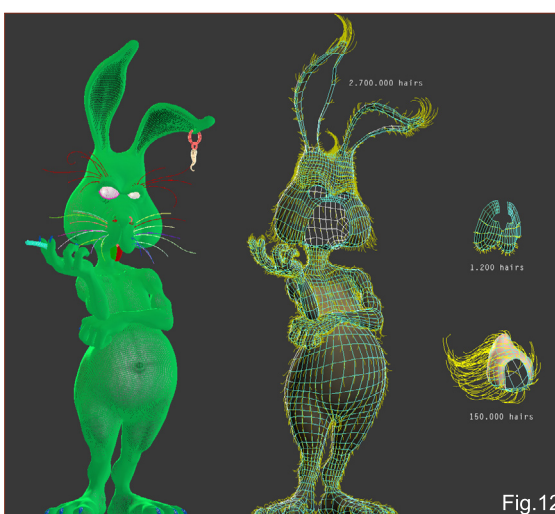


- In the Utilities box, click on the Recomb button so that the hair falls along the surface
- After, you can choose the Stand option inside the Styling box, and drag-and-click to the right slightly over your model to raise the hair guides a little
- This should give you a good starting point. After that, grow and comb the guides in small areas at a time, hiding the rest of the guides

It is a work of patience ... lots of it!

Another thing I learned during this project was the obvious fact that fur adds volume to the character (Duh!). All of a sudden, the nice sculpting details were covered by a thick layer of hair. I had to invest a lot of time combing the guides to make the fur flow along the skin's surface and keep a sharp silhouette. **Fig.11** shows the evolution of the combing, as well as the lighting.

It also came as a problem that the hair didn't look the same when rendered at different resolutions; it was very difficult to spot mistakes



and make decisions on the correct density at low resolution renders. In order to be able to test the hair correctly, I created a test scene with a single light, without any shadows or GI, and just a simple diffuse material for the skin mesh. Most of my hair render tests were made in this scene at about 3,000 pixels, and with render times of around 2 minutes.

After having reached the conclusion that I needed a hair count of about 2,700,000 hairs (!), another problem came up: I just couldn't render anything larger than the 1,500 by 3,000 pixels in resolution. I used the "hair buffer" method for hair rendering ("mrprim" and "geometry" couldn't handle this amount of hair), and at the time of rendering only two-thirds of the hair showed up. Later, I discovered that there is a 70MB buffer to write the hair to, and at higher resolutions this buffer value is not sufficient. In order to fix this, go to Effects > Hair and Fur; inside the Buffer

Rendering Options increase the Tile Memory Usage, and that should solve the problem. The bigger the resolution, the bigger the buffer! It sounds simple when you know what to do...

In **Fig.12** you can see the three different base meshes I used to grow hair on the body, snout and tail, as well as the hair count for each. The hair guides are represented in yellow.

In **Fig.13** I have compiled all the numbers used to generate the final hair. For the Tip Color and Root Color I used textures with a brownish tone – brighter for the tip and slightly darker for the root. Don't forget that the color swatches for the Tip and Root multiply by the texture color, so change the swatches to white or else it will affect the texture color.

**Fig.14** shows the hair resulting from the guides and settings previously described.



## THE SKIN

The renderer I chose for this project was V-Ray, a long time companion.

The 1.5 SP3 version of V-Ray presents a new excellent shader, the Vray Fast SSS2. It was created to make subsurface scattering materials fast and easy. I have used this shader for the first time in this project and it is very similar to Mental Ray's SSS Fast Skin Material. I can confirm that it is blazing fast!

Subsurface scattering was crucial in this piece because I had set up a strong light from the back and it allowed me not only to emphasize the rabbit's silhouette but also to represent the characteristic translucent effect in the ears. You can check the used textures and shader settings in **Fig.15**, as well as the render result of the applied skin material in image **Fig.16**. You will notice, by examining the fingers on the right hand, that the subsurface scatter radius is a little bit exaggerated. However, the important parts were the ears, as the rest would be covered by hair.

## THE EYES

For me, the most important part of a character is the eyes. Unless you are representing a dead corpse, if the eyes don't look alive, you will ruin the entire piece. People look at each other's faces all the time and the main focusing point are the eyes. We are so used to observing

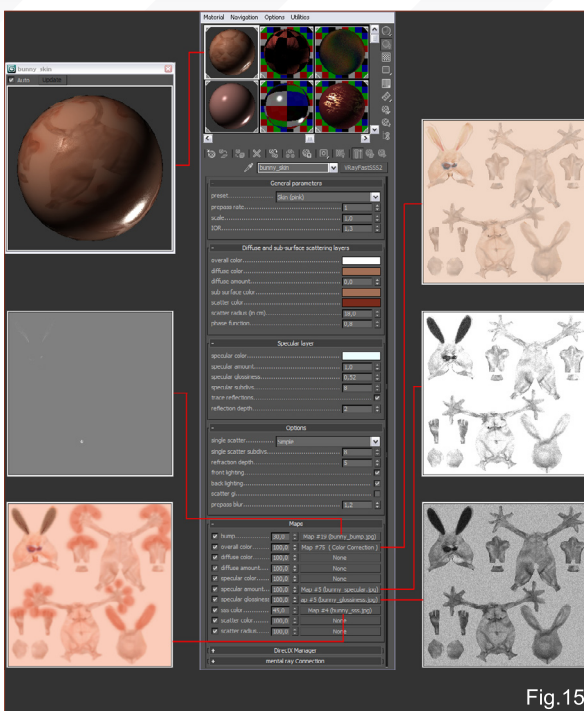


Fig.15



Fig.16

eyes that if something is wrong in their representation, we will immediately spot it.

I believe that there are the nine essential points in eye representations that have to be nailed in order for your character to look lively (**Fig.17**), as follows:

- **A.** Shadow line below the eye lid falling on the iris
- **B.** Bright highlight revealing the strong light sources – I used an HDR image on the environment to achieve this
- **C.** Highly reflective cornea (not forgetting the Fresnel effect)

- **D.** Reflection/brighter area on the iris on the opposite side of the main highlight/reflection
- **E.** Smooth dark edge surrounding the iris
- **F.** Recessed Iris – the iris is not so recessed in reality, it is actually quite plane. However, by pulling back the pupil we emphasize the refractive effect of the cornea and the liquid that exists inside the eye, instantly looking more alive
- **G.** Solid cornea – it is very important to model the cornea with thickness so that you can use an Index of Refraction and slightly distort what is behind it. In this case I have used an IOR of 1.4
- **H.** Milky sclera – the white of the eye has a milky look and shouldn't be represented as bright white. I used the VrayFastSSS2 shader with subsurface scattering to achieve that look
- **I.** Wet look – the tear line in the contact area between the cornea and eye lid. I created a spline with thickness, converted it to Editable Poly, and changed its shape in order to achieve a watery look

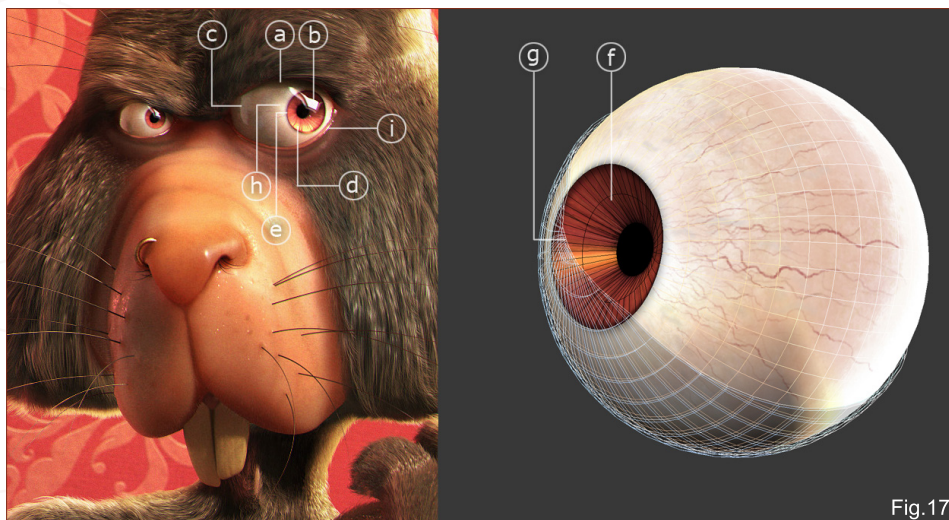


Fig.17

## COMPOSITION

One trick I use to test the composition of a scene is "paintovers". I take an image into



Photoshop and extend/crop the canvas size, twist it, paint new elements, change colors, etc. It is a quick and dirty method to preview changes. If I like them, I recreate them in 3D.

**Fig.18** is one of those tests. In this one I took some decisions, like placing an ashtray near the character and a few framed paintings on the back. I decided to flip the image horizontally because it worked better that way – we read it from left to right. I also added a slight tilt to make the composition less static. The rabbit's eyes are at a one-third distance from the top and from the right side, in order to become the center of our attention.

In the final composition (**Fig.19**) I had some trouble making sure the Mona Lisa did not compete with the rabbit in terms of attention. For that I had to let the rabbit's ear slightly overlap Mona Lisa's frame, so that it became obvious that the painting was behind the rabbit. I also intentionally left Mona Lisa's eyes out of the picture to avoid having two pairs of eyes fighting for the viewer's attention.

## COMPOSITING

Photoshop was used for all the compositing. I had already done a lot of lighting and material tests in 3ds Max, and as such I didn't find it necessary to create render passes to fine-tune the lighting, reflections, etc. further.



I rendered three separate hair passes – body, snout, and tail – by setting the Composite Method to None in the Effects > Hair and Fur window. I rendered the base image with the hair shadows but without the hair by setting the Composite Method to Off in the Effects > Hair and Fur window. A ZDepth pass was also rendered and used to defocus the background with the Lens Blur filter in Photoshop. In addition to this I rendered an Occlusion pass using Mental Ray, which I consider to have a far



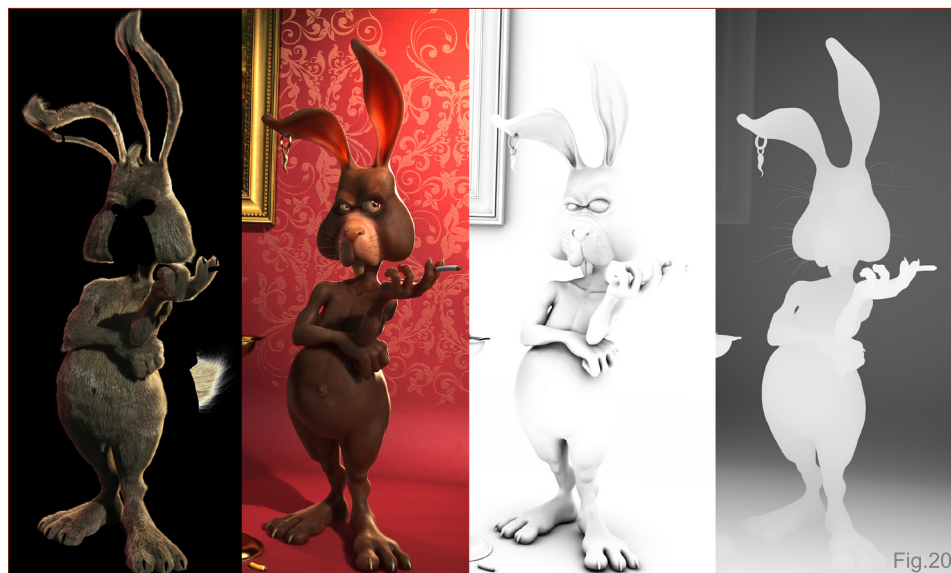
superior occlusion shader comparing to VRay's dirt shader (**Fig.20**).

To finalize the image, I painted some dirt marks on the wall and on the floor, painted the smoke in the air and coming out of the cigarette, and added more light from the top right corner by painting over the image with the Color Dodge blending mode.

## CONCLUSION

The technical aspects of a piece are important, but what really matters is the reaction it provokes on the viewer. I like humorous images that make people smile. That was the main goal of this piece. I also introduced some secondary comic elements on the image, like the smoking Mona Lisa and the carrot earring, because it's fun for the viewer to discover the jokes as they explore the image.

I am very happy with the way the final image turned out (**Fig.21**). I hope you have enjoyed this article as much as I have enjoyed writing it for you. Thanks for reading!







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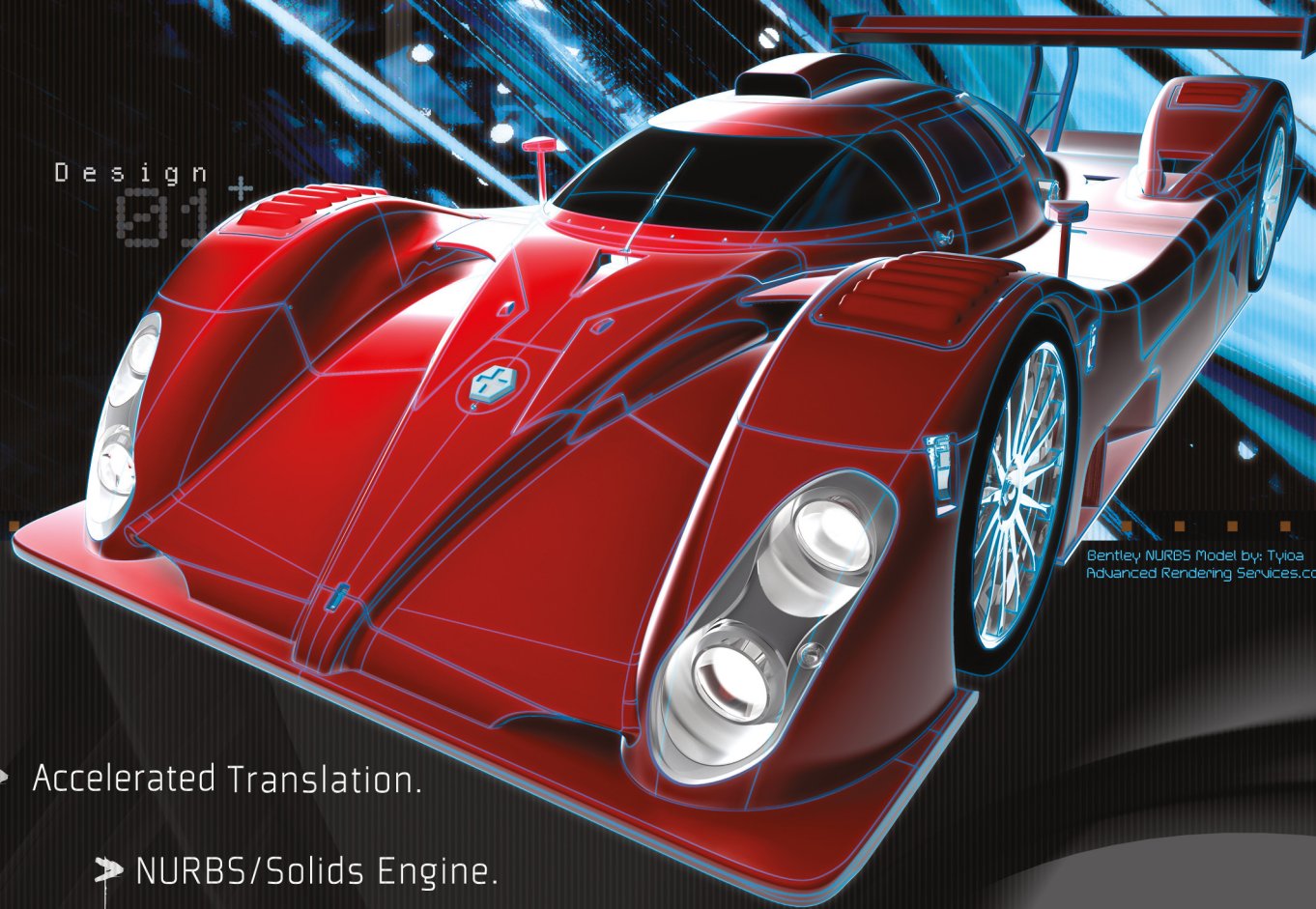
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This month we feature:

**"Kids"**  
by Michal Kwolek







The following shots of the "Kids" book pages are featured here in full-resolution and can be read by zooming in...

## KIDS

BY MICHAŁ KWOLEK

SOFTWARE USED: 3d Studio Max, V-Ray, Photoshop CS3 and Unfold3D



**CONCEPT**  
This particular piece was created for a contest on a Polish CG portal, max3d.pl. The subject was "The Terrible Consequences of TV Malfunction". My idea was to show a married couple who, due to a TV malfunction found "other ways" of entertaining themselves: making babies. I wanted to show the kids playing up and causing their parents great annoyance, which was also the core of this terribleness. I wanted to create the whole image in a cartoonish, colorful style, so it could be easily readable and warm in its atmosphere and mood.

### MODELING

I started the modeling process by creating the characters first of all (Fig.01). I figured that I was going to need 3 models for the characters in my scene: a dad, a mum and a kid. There are 5 kids in the final composition, but it's the same model with slight differentiations, such as changes in the facial expression or haircut.

I used the poly modeling technique for the models, which gave me great control and ability. The overall shapes of the models were created from a single polygon; they are very simple models with a low polygon count (Fig.02), which employed smoothing (TurboSmooth) when necessary. Simple beveled skinning was a good choice for setting up the poses for the characters as it was fast and simple (Fig.03).

I then modeled the couch, television set and the rest of stuff in the scene. I sacrificed most of my time on the television (Fig.04); after all, it was meant to be the main



Fig.01

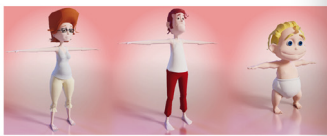


Fig.02



Fig.03

"character" in the scene! There are a lot of small pieces in it that are not even visible and I gave it a decent amount of wires, cables and so on. These additional models were nothing more than lofted shapes along the splines. Most of them were created without any concepts, just modeled as I imagined them.

The room itself was made of 2 boxes connected by the doorway, which gave me a room and a kitchen. To create wallpaper which was coming off the wall, I just applied flat surfaces and modified the corners so they would look convincing enough.

Besides the handmade models I also used the cloth modifier. For the rug on the right of the scene I applied the modifier and simply "threw" it onto the ground. Thanks to that

I achieved a realistic shape and some nice folds in the cloth. Finally, the surface of dad's slippers and the carpet were both enhanced with the displace modifier and a procedural noise map.

### TEXTURES & MATERIALS

The textures in this scene were very simple; in most cases created from scratch, but based on procedural textures (such as the wood elements, rug and blanket). The adults' and kids' clothing were just multiplied, simple patterns modified to fit the UV mapping applied. I had the most fun working with the pictures on the wall – especially the one from the wedding day. This photo was a mix of a wedding photo that I found with the heads of dad and mom overlaid on top. I had to do some over-painting work on the heads, but it was worth it (Fig.05). The rest of the pictures were created from renders and modified a little in 2D (color correction, composition, adding the background, etc.). The skins of the characters were painted with a simple brush in Photoshop – there's not much detail, but that was the look I was going for.

The materials used in this scene were basic V-Ray materials. Every single one had a diffuse channel and reflection with a falloff based Fresnel. Only the wallpaper material consists of two sub materials: the main and the embossed, shinier pattern.

### LIGHTING

The key light in this scene was a warm light coming from the lamp; it's this lamp which illuminates the characters the most, as well as the room as a whole. This light is the one placed just above the lamp model and it was given a value of two. The shadows were area V-Ray shadows which gave them the desired softness. The next important light was the one from behind the window. To create this one I set up two direct lights with a soft, bluish tone, imitating the blue light of night and one white light to act as direct moon light. The rest of the lights were Omni lights with the color set to blue that fill the right side of the room and the kitchen. There are also two



Fig.04



Fig.05

more lights giving additional illumination to the characters, set very closely to them and with very low values, like just 0.2 or 0.3. Every light has an option decay set to Inverse Square. This option gives a nice light fade effect the further away it is from the source. I recommend this because it allows you to get great lighting in a fairly simple way.



Fig.06





**RENDERING & POST-PRODUCTION**  
I used V-Ray as my rendering engine, and the final image was rendered in four passes: diffuse, reflection, color and ambient with GI; the resolution of each was 4000x3000 pixels, and an antialiasing V-RaySincFilter was also used (value 4.0), which gave nice, balanced, sharp edges.

I didn't modify the rendering settings. I used defaults (which is medium for the GI tab). It gave me a satisfying effect with a fairly low rendering time. After compositing the passes I then color corrected some areas. I didn't want to "ruin" the original piece after the rendering so I did the corrections on adjustment layers. These layers don't influence the image directly and they're created with a mask as you go, so this gives you a lot of control overall. The image after color correction was different from the one before, mainly with regards to the contrast and saturation (Fig.06 - 07). I also modified the characters' skin a little as well, adding a bit more life to it.

#### CONCLUSION

I think that I managed to get the right effect with this image, and I actually won the contest for which this piece was originally created! I'm most satisfied with the colors

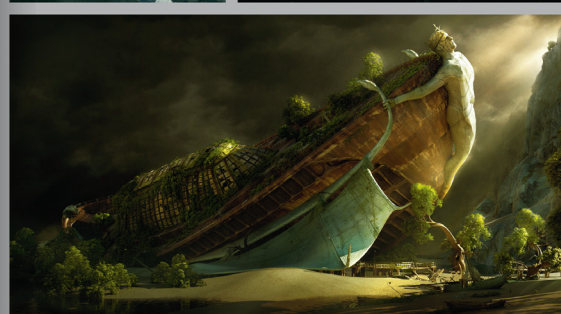


and composition; the only thing that I'd change now is the number of kids. I think that there should be some more of them, and also they seem a bit too good. They don't appear to misbehave as much as I had wished. A lot of people also told me that dad's pose is not very readable. Well, maybe that's the way it is? Dad ought to just look at a hole in his sock and say, "Oh no, another problem!"

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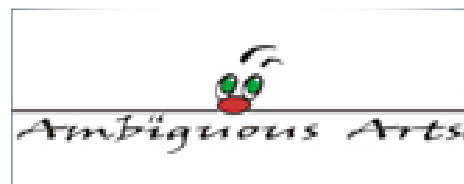
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**Next Gen Character  
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Part 4 for ZBrush, 3dsmax

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# NEXT GEN CHARACTER CREATION SERIES

This series of tutorials provides a comprehensive guide through the process of creating a 3D character intended for use within a next gen console environment. As such, the design of the model will be tailored towards the eventual aim of functioning within a game engine and viewed in real-time. The series will cover all of the key stages of the 3D pipeline from sculpting the initial mesh in ZBrush and optimizing it in the principal 3D packages, through to texturing and applying next gen shaders. The inclusion of ZBrush tutorials will address the methods of sculpting both a low-poly mesh as well as a highly detailed version used to generate a normal map, and accompany the remaining software specific chapters that will detail topics that cover mapping, materials, lighting and rendering.

CHAPTER 1 – LOW POLY MODELLING | JUL 09

CHAPTER 2 – HIGH-POLY MODELLING PART 1 | AUG 09

## CHAPTER 3 – HIGH-POLY MODELLING PART 2

Chapters 2 and 3 are ZBrush specific chapters that cover the methods used to sculpt a detailed and high-poly mesh from the low-poly version. The value of subdivision alongside the key tools and brushes used in the process will form an integral part of the tutorial. It begins by importing the optimised mesh back into ZBrush in readiness for a methodical approach to refining each of the limbs and body parts.

CHAPTER 4 – MAPPING / UNWRAPPING | OCT 09

CHAPTER 5 – NORMAL MAPPING – TEXTURING | NOV 09

CHAPTER 6 – MATERIALS, LIGHTING & RENDERING | DEC 09





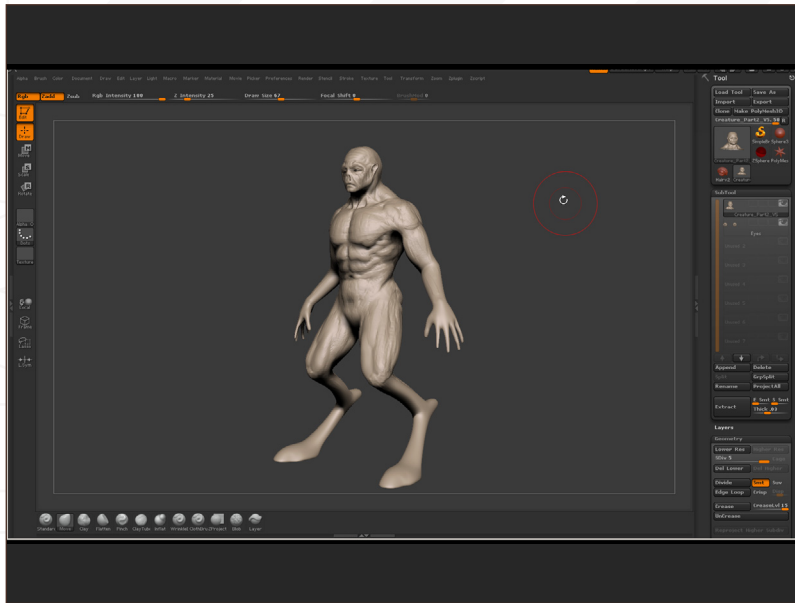


Fig 01a

## CHAPTER 3 - HIGH-POLY MODELLING PART 2

**Software Used:** ZBrush

1. Continuing on from where we left off in Part 3 of this tutorial series, unhide the rest of the model by pressing Ctrl + Shift and dragging outside the model, and take a look over the character. See if the muscles are large enough and if they all balance together well. To aid in this process go to Render > Preview Shadows and change the settings to increase the strength of the shadows and their depth. Don't forget to write down the original settings to get back to, as ZBrush does not have a 'revert to defaults' button. Good settings for this step are to lower the slope value to make the lighting overhead, increase the ObjShadow to 100 to darken the shadows, and increase the length slightly (Fig.01a – 01b).

Let's take a look the Preview Shadows menu (Fig.01c):

- **ObjShadow:** Increases or decreases the opacity of the shadow. Increase the number to darken the shadow and lower it to lighten it
- **BackShadow:** This adds a drop shadow to the background of the object, similar to the way Photoshop would add a drop shadow to objects on a layer. It's a 2D process so its uses are limited
- **Length:** Increase the length and softness of the shadow. The higher the number the more shadows look like global illumination
- **Slope:** Starting with a value of zero the light is overhead of the model. Increase the number to move the light further in front of the model. A low value can produce quite dramatic lighting
- **Depth:** As ZBrush's Help tell us, this deepens and enlarges the shadows

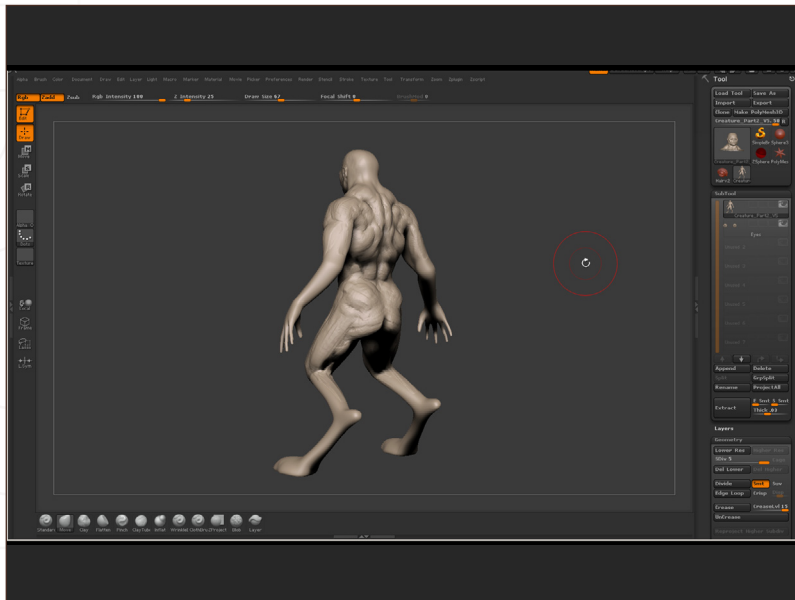


Fig 01b

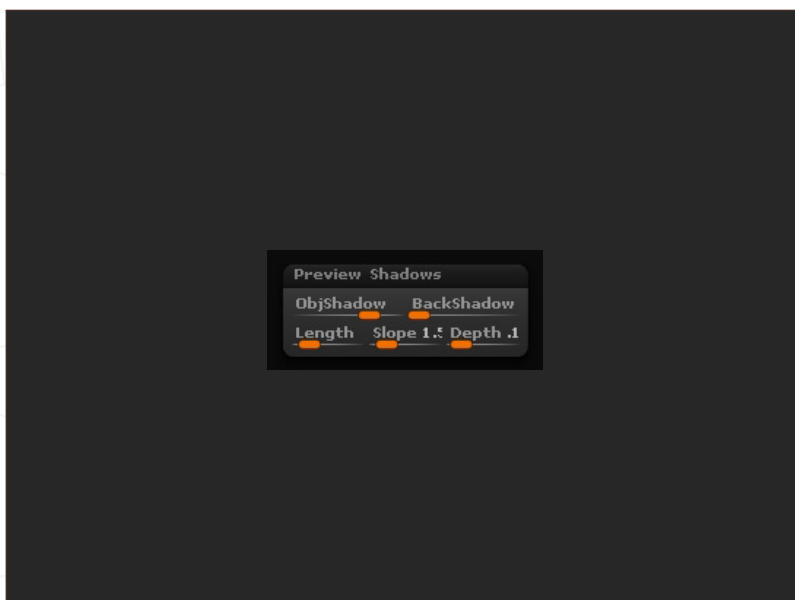
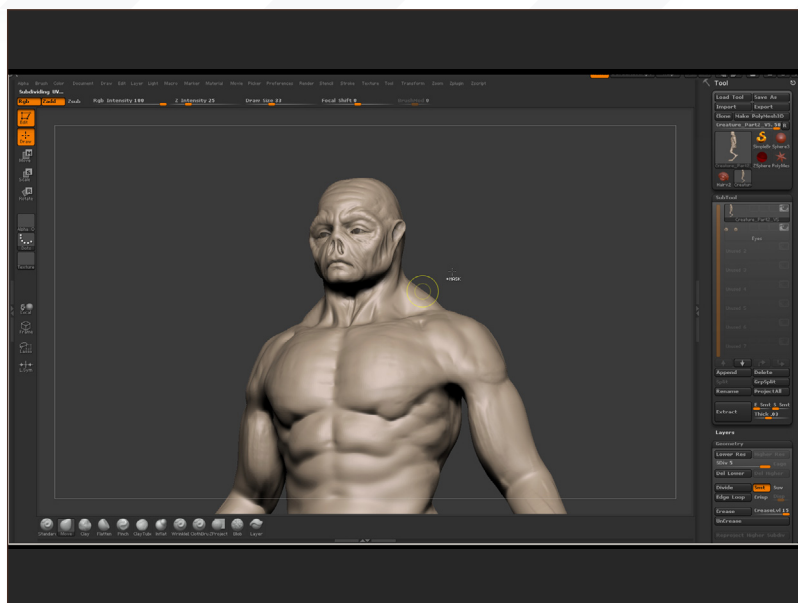


Fig 01c



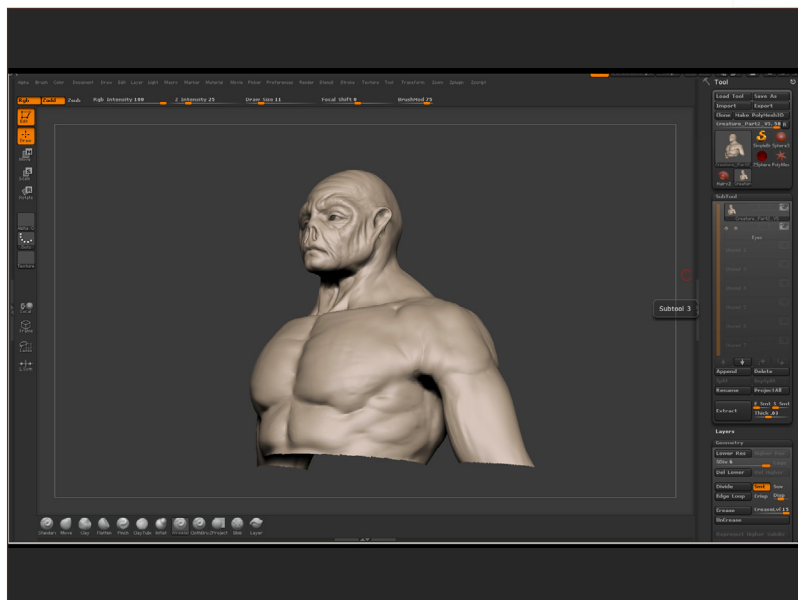
2. Smooth over the whole model now, taking care to do it lightly so the volume of the muscles is maintained (**Fig.02**).

Fig 02



3. Cut into the model using our Wrinkle brush (created in Part 2 of this series) where the muscles of the chest form pinches from the centre outwards. Also, from the underarm we can add a couple of pinch cuts. Inflate the areas surrounding these indentations to make it look fleshier (**Fig.03**).

Fig 03



4. Moving down the model, it's time to define the abdominal muscles more. Work through the muscles from top to bottom using the Clay Tubes brush. I've also further sculpted the thigh muscles, thickening some and defining the knee bones (**Fig.04**).

Fig 04





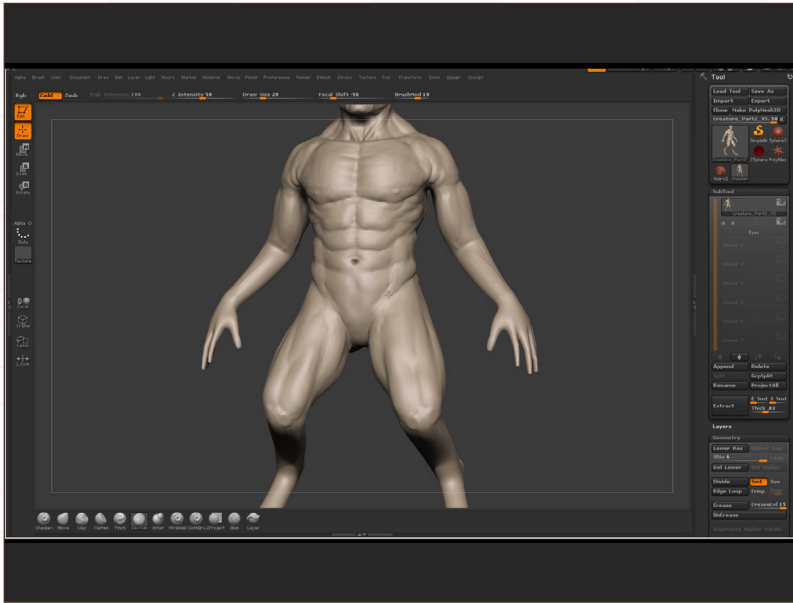


Fig 05

5. Further define the abdominal muscles.

Bodybuilders are a great reference here as all their muscles are sticking out and heavily defined. Just be careful that they are not clenching too much, as that is not a relaxed, neutral pose (**Fig.05**).

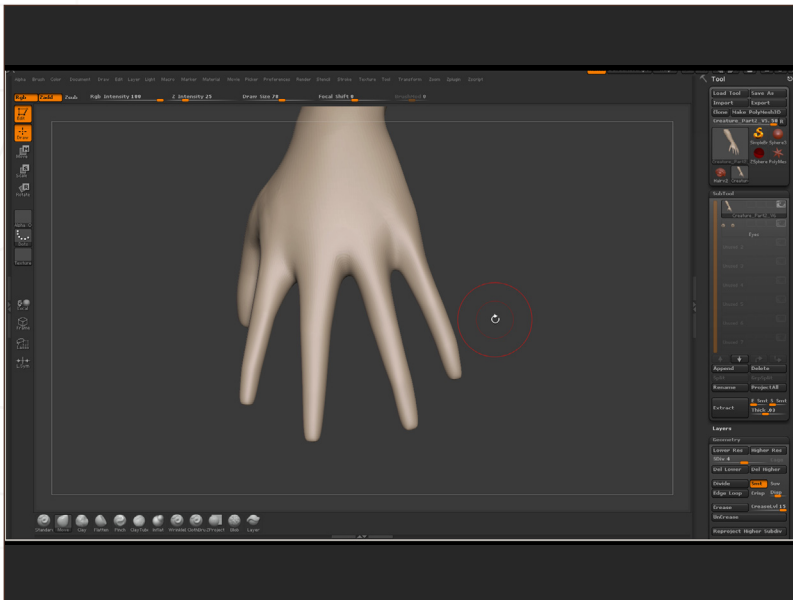


Fig 06a

6. It's about time we started to work on the hands. We have the proportions correct already from the time spent on the base mesh, so we can go ahead and sculpt the hands directly. We will only work on one hand and then mirror it over later, as working with symmetry is difficult due to the camera reverting to the pivot point in between the two hands as a rotation point. Isolate the hand section up to the forearm. Turn off the symmetry by pressing X. Using the Inflat brush with a large brush size, lightly brush over each finger to enlarge them. They are much too thin at the moment due to when we divided the mesh (**Fig.06a – 06b**).

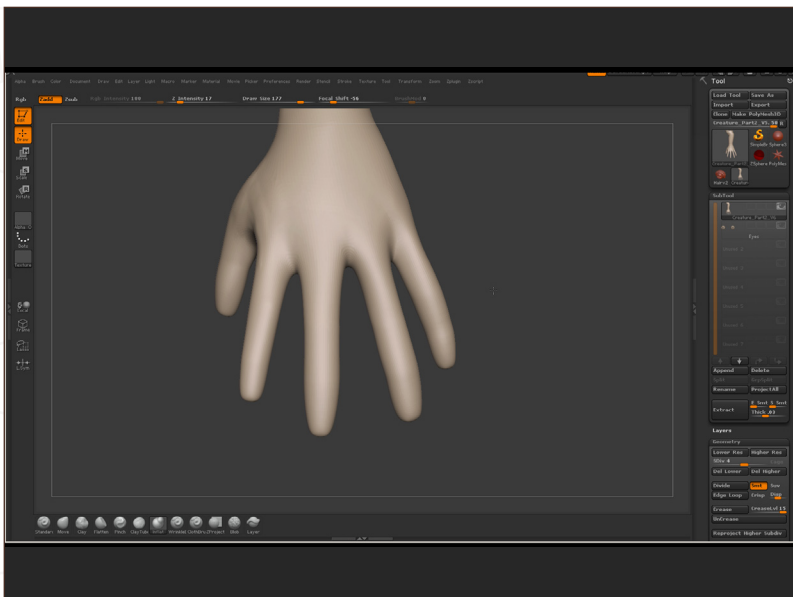


Fig 06b



7. Paint a mask where the fingernails should be. We want to just be roughing out the fingernails to check the proportions. Invert the mask and move the tip of the nail up and outwards. Invert the mask again, and use the Inflat brush around the base and sides of the nail to create the effect of the nail growing out from under the skin (Fig.07a – 07c).

Fig 07a

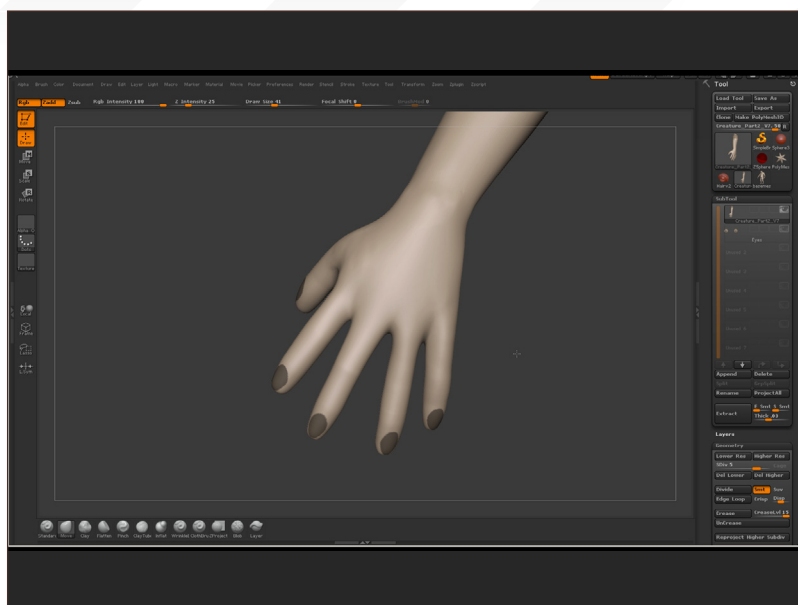


Fig 07b

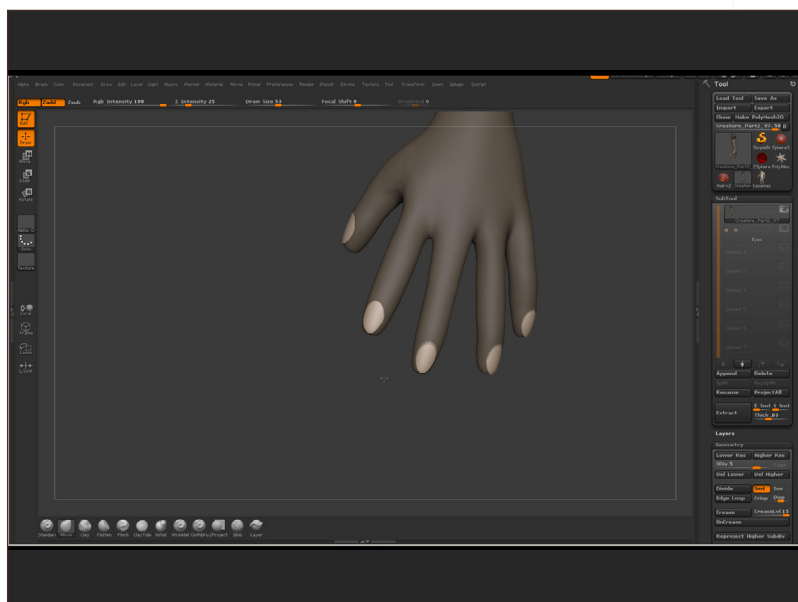
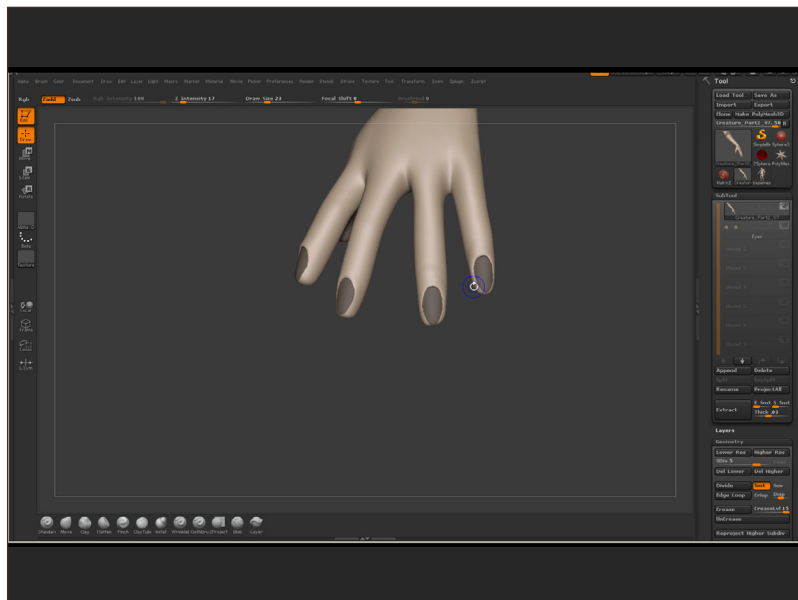


Fig 07c





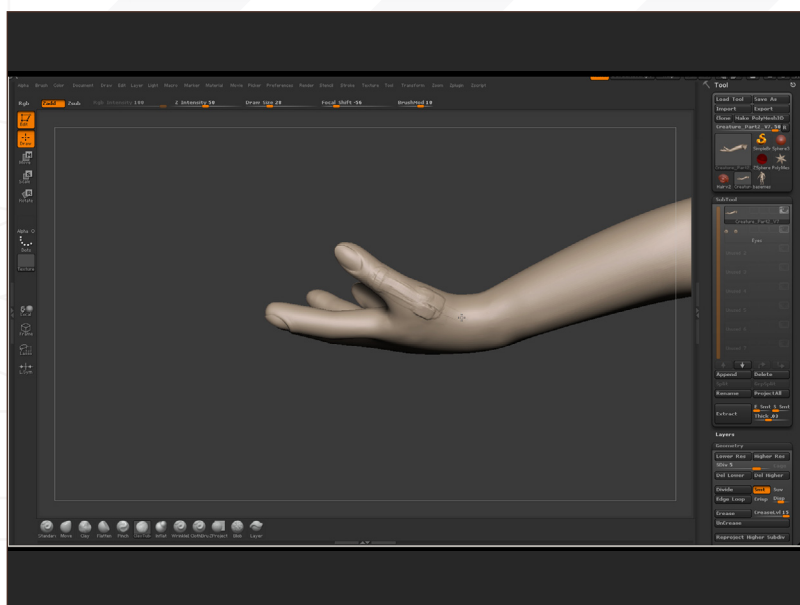


Fig 08

8. Go on to block out the thumb and fingers in the same way as the muscles. Start by roughing in each knuckle of the fingers and thumb, making sure they are at the correct locations anatomically. You can use your own hand as reference at this point before we make changes to make it fit our character a little better (**Fig.08**).

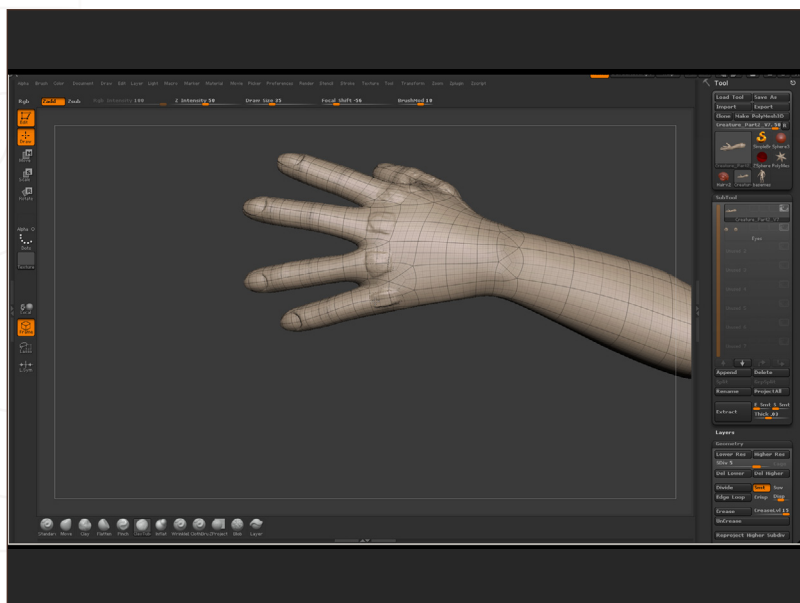


Fig 09

9. As the topside of our fingers is quite flat and the fingers are more of a rectangle in cross-section, we can use Clay Tubes from knuckle to knuckle. It's again useful to display the wireframe here to make sure you are sculpting on the areas we designed the topology for (**Fig.09**).

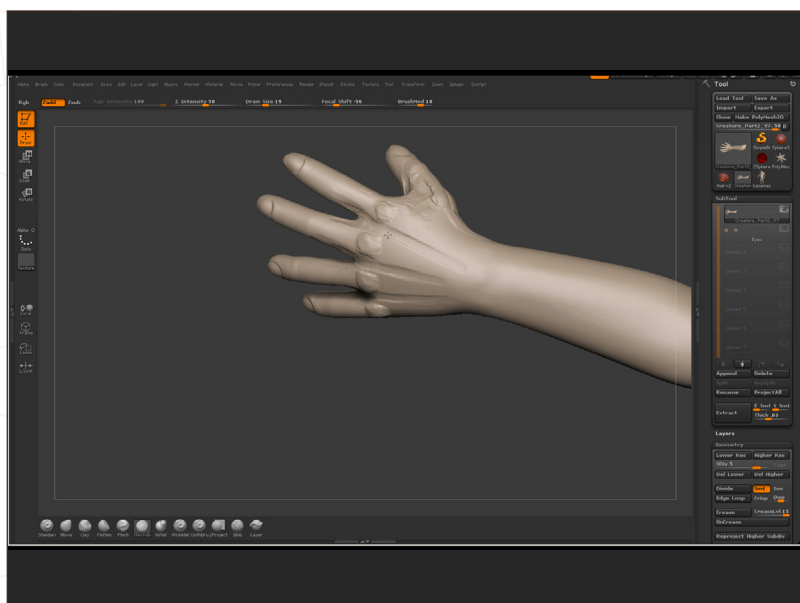


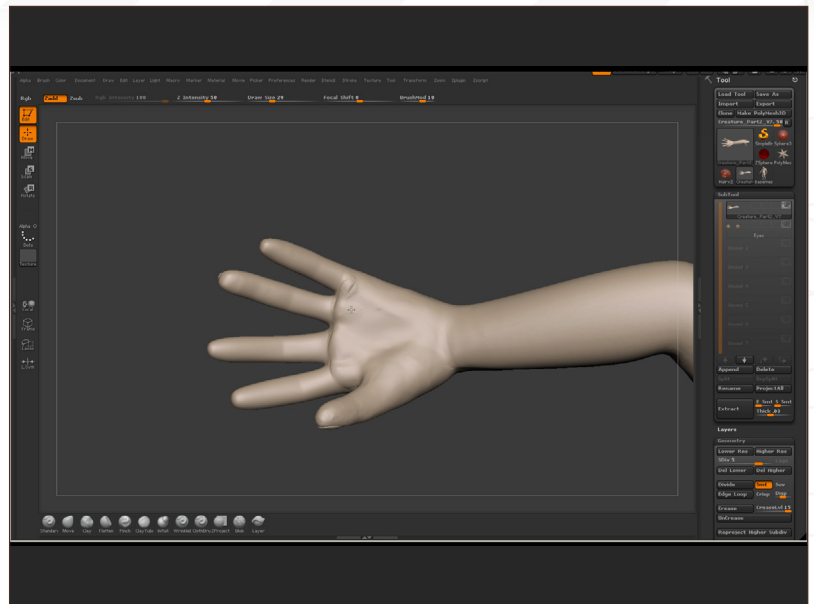
Fig.10

10. Now cut into the model again using the Clay Tubes brush. Cutting the mesh with this brush is similar to using a chisel and shaving off layers of wood. We can cut out the indentations that run from between each knuckle to the wrist, and up to the middle of the fingers. Create the base for the webbed area between each finger (**Fig.10**).



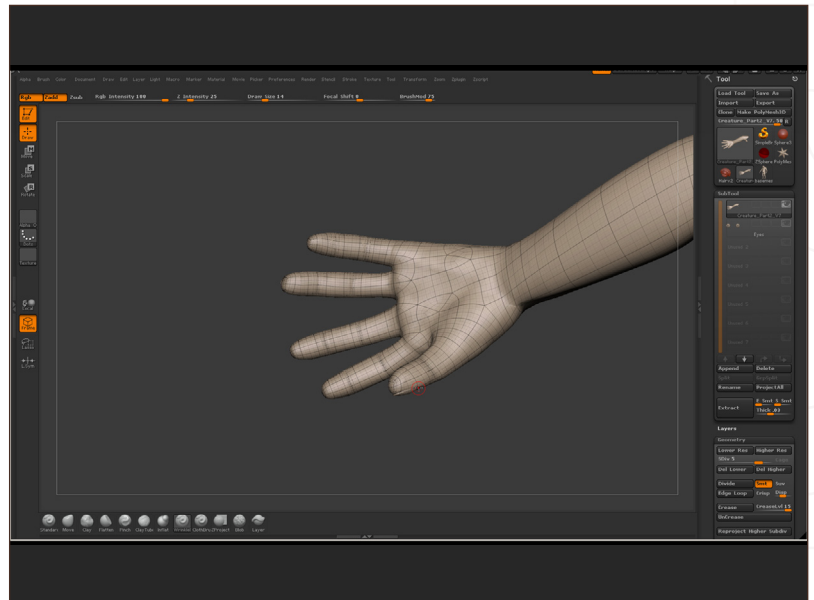
11. Sculpt the palm of the hand in the same way, making sure to keep volume on the pads of the palm, below each finger, the base of the thumb, and all the way from the little finger to the wrist. You can cut the other sections out with the Clay brush or use the masking method. Add a little more volume to the pads below the fingers (Fig.11).

Fig 11



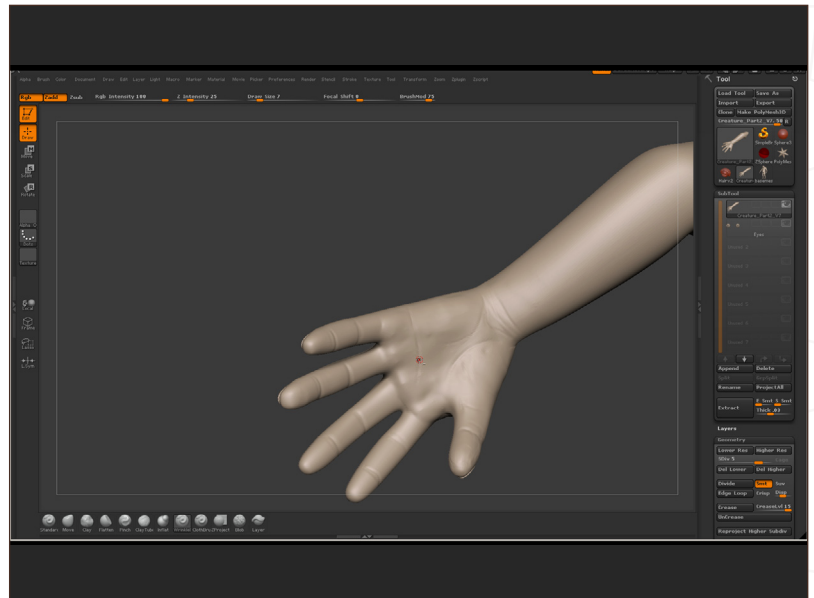
12. Score the fingers at each joint. We do this for proportion reasons as much as to add detail. Turn the wireframe on as usual to do this, to make doubly sure it's in the right location (Fig.12).

Fig 12



13. Add the main lines of the palm and wrist with the Wrinkle brush. We won't go much further into detail than this with the hand as the model is for realtime, and the area of texture reserved for the hands will not be of a high enough resolution to take any more detail. If there were a specific cut scene where the character's hands were visible close up, we would create a unique texture and switch to it for just those shots (Fig.13).

Fig 13





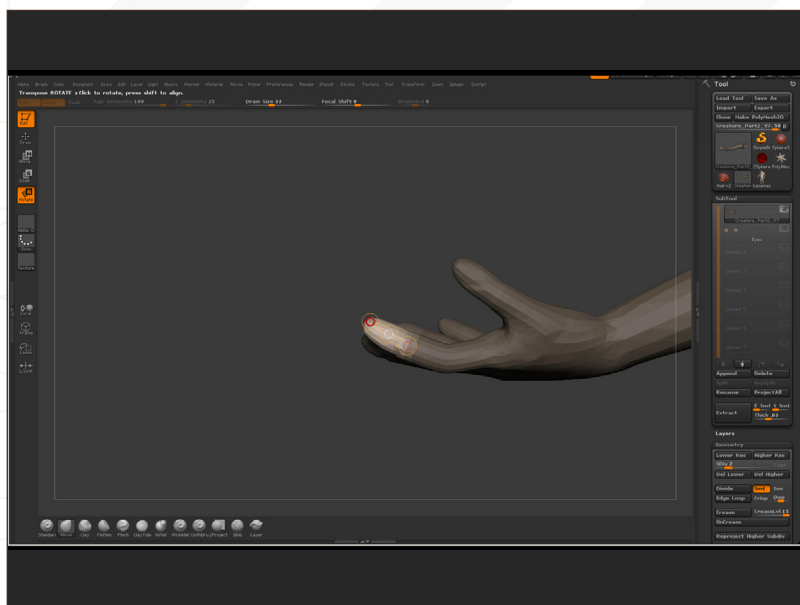


Fig 14

14. We are now going to make sure the fingers are sculpted in a relaxed position – not too curled, but also not too straight. Mask off everything except the tips of the index finger. Drop down to a lower subdivision level by hitting Shift +D (Fig.14).

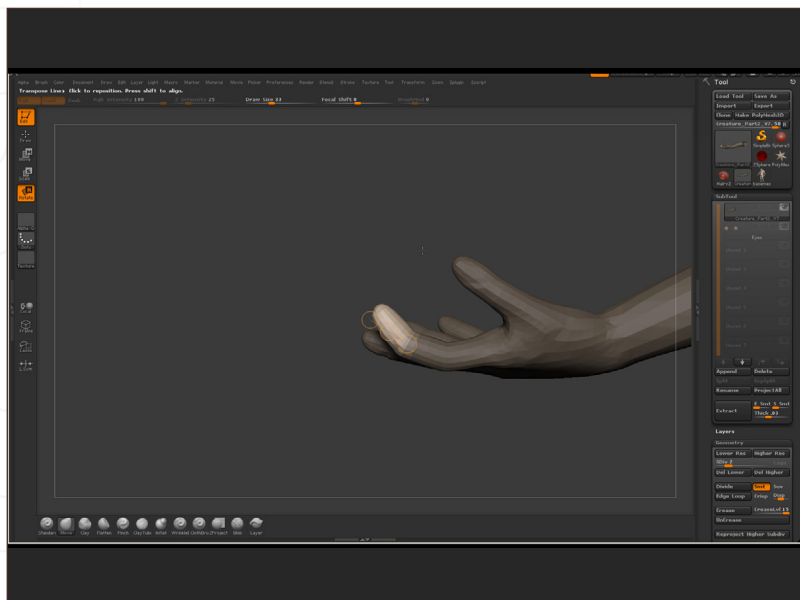


Fig 15

15. Press R on your keyboard to change to Transpose > Rotate mode. The model is still active but now we can move the unmasked section about using pivot points. Drag from the last joint of the finger to the tip. Check from all angles to make sure they are placed as in the middle of the joint as you can. You do this by dragging the outer circles to move them around. You can then drag the inner circles to drag the mesh around, using the opposite circle as a pivoting point. Select the inner circle at the tip of the finger and pull upwards. Whilst in Rotate mode the finger should now rotate using the joint as a pivot, as it would in real life. Move it just enough so we know it is bent (Fig.15).

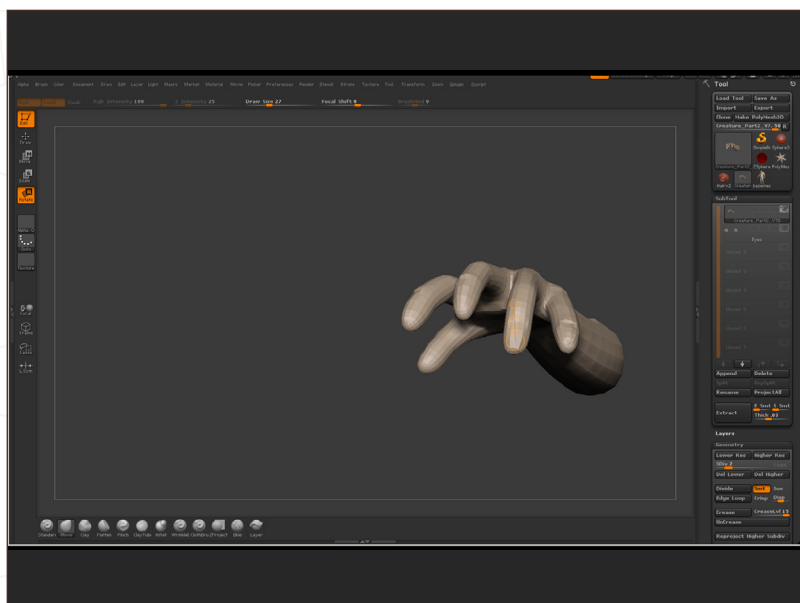


Fig 16

16. Now proceed to do this with each joint, unmasking the area of the index finger up to the next joint and performing the same rotation. Once the index finger is done, we can do this with all the fingers and thumb. Unfortunately there is no shortcut to do them all at once here, as they all need their own unique pivot points (Fig.16).



17. With the fingers completed, go on to add a few more wrinkles to the finger joints. Work on the shape of the hand also, using your own hand and gathered material as reference. The hand has a lot of bones in it and can be a complex form to master, so it's important to take your time over it. Just like the face it's extremely recognisable; we see them in front of us typing all the time and we will know if it does not look right (**Fig.17**).

18. With the hand complete, we can mirror the work we have done over to the other side. Unhide the rest of the model, and mask off everything apart from the character's right hand, which is the hand we have not worked on. Make sure the mask reaches further up than we had worked on, so the model stays symmetrical. You can do this at a lower resolution if you like, but make sure the model is at its highest subdivision level before we go on.

We can smooth the mask over now by Ctrl + clicking over the masked area. The lower the subdivision level the more of the mask that will be smoothed, so if you want a very wide transition between masked and unmasked drop to a lower level before smoothing the mask (**Fig.18**).

19. Make doubly sure nothing is unmasked, except for our hand and forearm. This is important here because any stray selections, no matter how small, will result in inconsistencies in the symmetry later on and will cause us problems.

Within the Tool > Deformation palette find the button called Smart ReSymmetry – click it. This will take a little while, between 1 and 10 minutes depending on your computer speed and the level of subdivision your model is at. Don't be surprised if it takes a long time, it will eventually come back and your model will be symmetrical again (**Fig.19**).

Fig 17

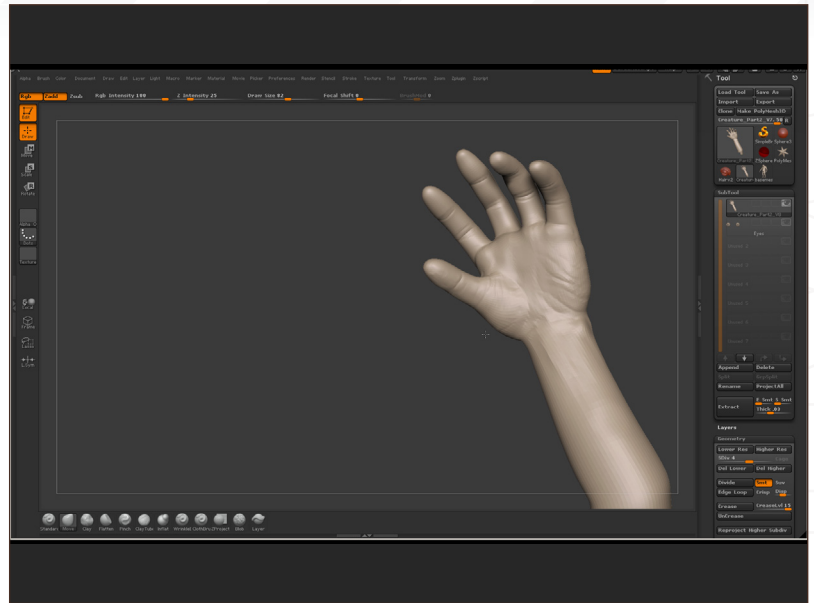


Fig 18

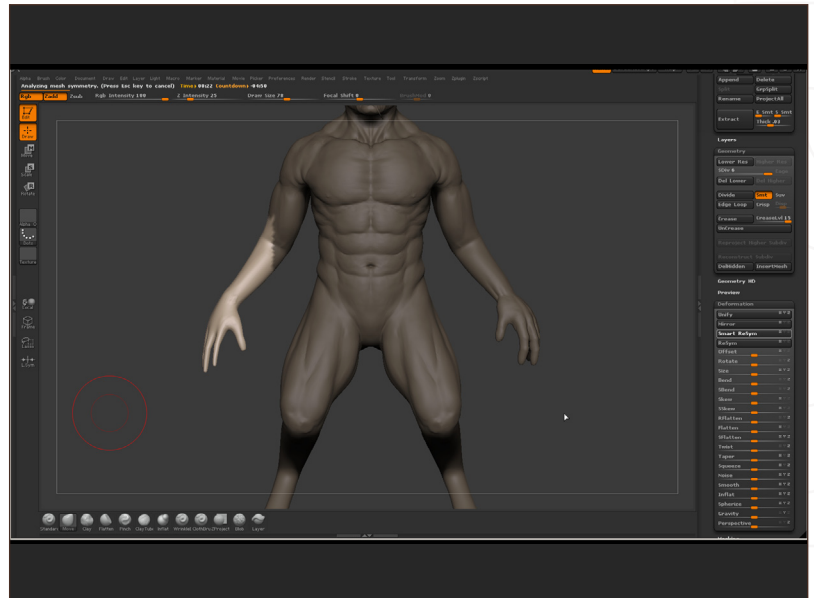


Fig 19

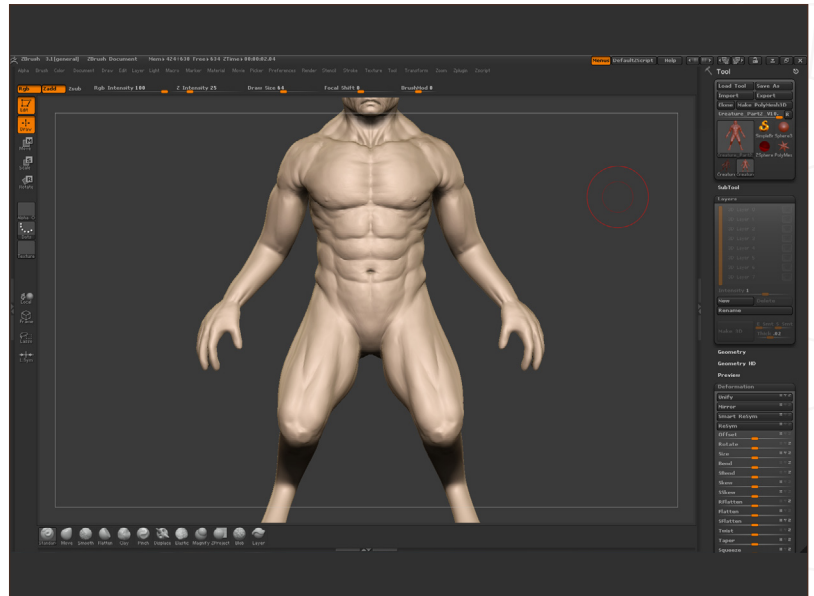






Fig 20

20. Let's move on to sculpting the lower legs. Good references for these are thin dogs, horses, and fantasy creatures that seem to have legs like this. I imagine the bones of the lower shin sticking up and out of the mesh, so sculpt the two ball-like ends of the bone.

Using the Clay Tubes brush once again; run muscles down from the first knee joint to the second. Imagine how this type of leg would work and what kind of muscles would drive them (Fig.20).

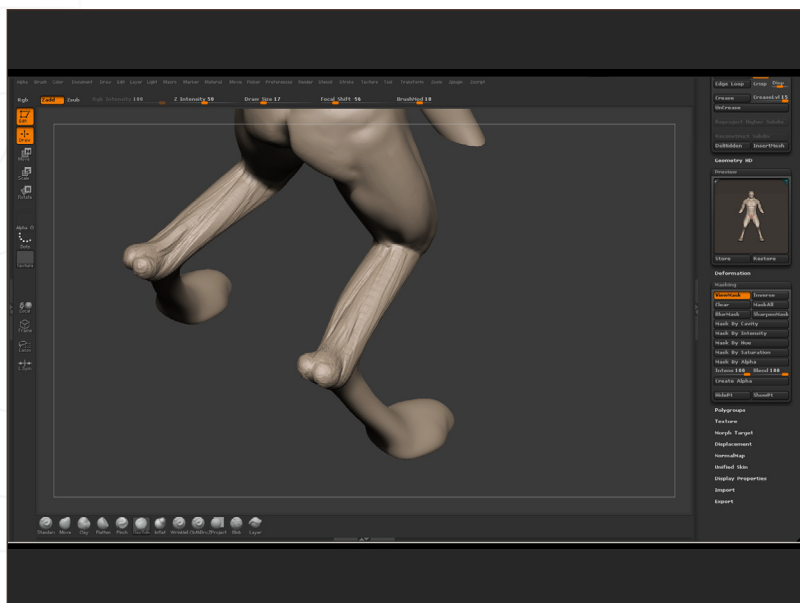


Fig 21

21. The skin would be quite stretched here and run over the top of the protruding bones, creating an interesting effect. So stretch the geometry out using the Move tool, or build it up in layers with the Clay Tubes brush, smoothing when done (Fig.21).

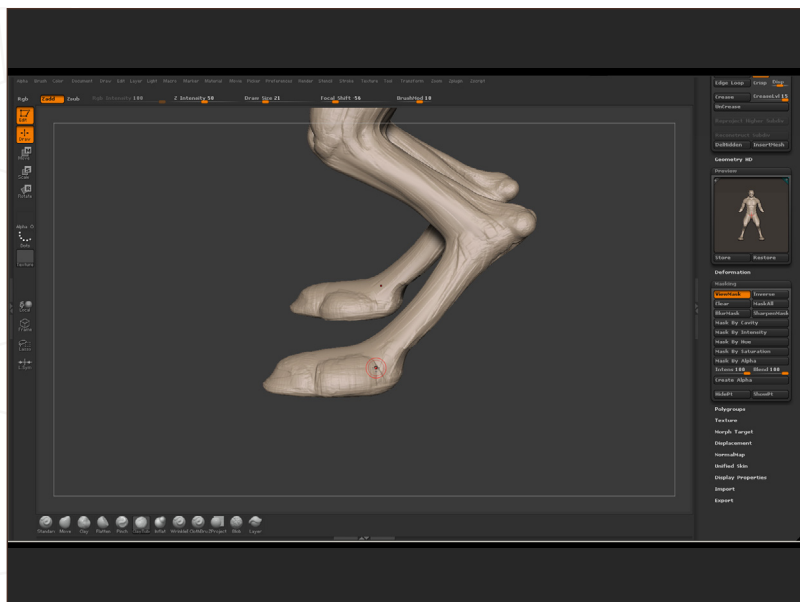


Fig 22a

22. Rough out the feet at this point also. The character has hooves like a camel or horse, rather than having human-like toes. These hooves are made of thick, hard material and will not be fleshy or hairy, so we will make deep cuts into them and sculpt them to look this way. Sculpt the back of the feet at this point, too. I've chosen to include more sticking-out bones to add interest to the otherwise flat back of the foot (Fig.22a – 22c).



Fig 22b

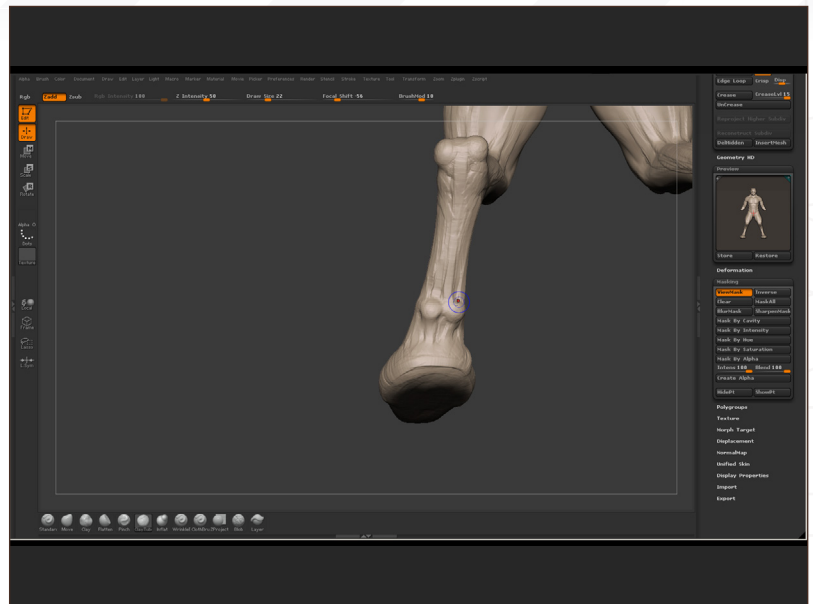
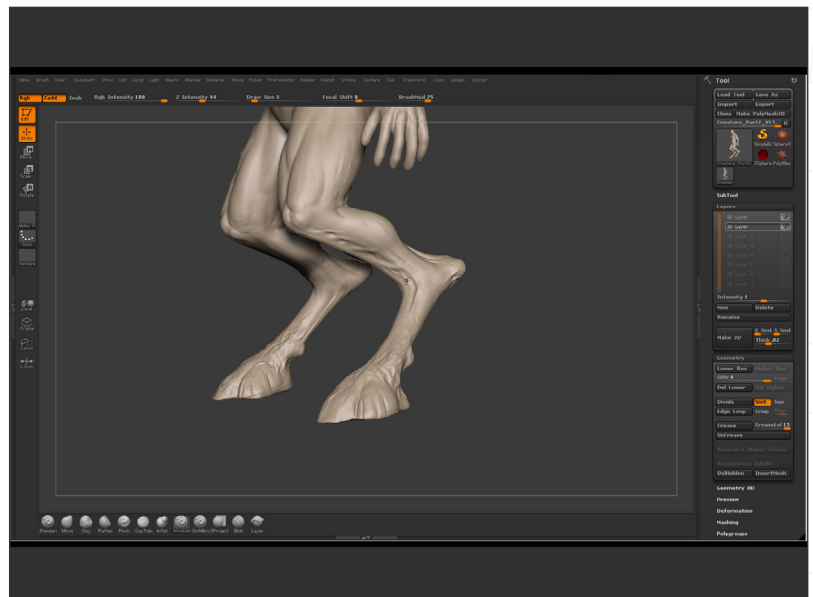


Fig 22c



23. Increase the size of the foot vertically. I felt the large width of the feet was not fitting with the overall slick form of the character, so move the sides of the feet inward towards the middle. I'm also going to add detail to the calf muscles. I want to make it look like the skin is stretched (Fig.23a – 23b).

Fig 23a







24. Moving on now to the arms, we still have to add the shoulder, upper arm, and forearm muscles. Let's make sure that the arm proportions are correct. Make sure the bones that end the forearm stick out in the right places, and the wrist is appropriately sized. The wrist should be more of a rectangle, transitioning into an oval as it reaches the elbow joint. Also add in wrinkles on the top of the fingers, where there is excess skin for when the fist is clenched (Fig.24a – 24c).



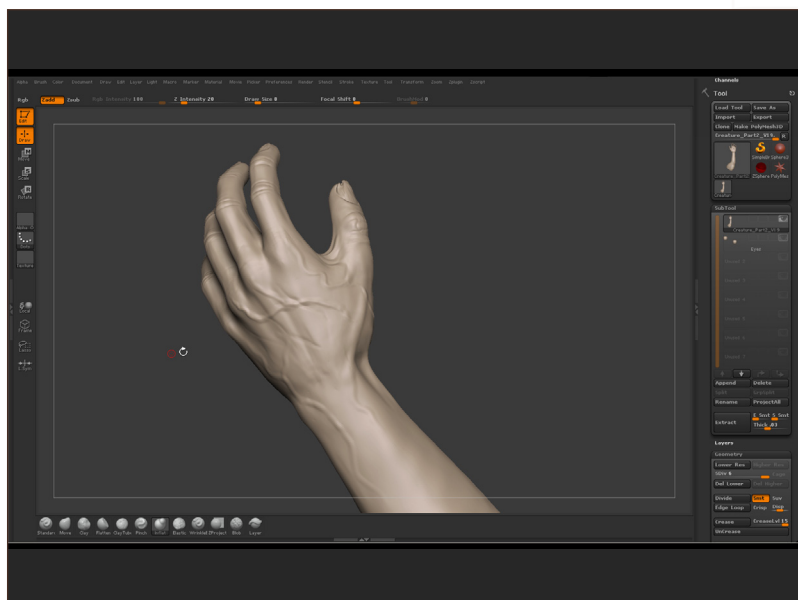


Fig 24c



25. Take this opportunity to also add veins to the topside of the hand that run in cross shapes and in and around the fingers. An extremely useful reference tool here is to look for anatomical vein maps; the kind that medical students and doctors use to locate certain veins in the body. You can use these to locate where to place your veins on the model and where to paint them in the texture. Opposed to painting them in blind, this will guarantee your model an extra level of realism that will be noticed subconsciously (Fig.25).

Fig 25



26. Look out for some references now for the arm muscles. Sculpt in the order of deep muscles to surface muscles. The two major forearm muscles wrap around from their insertion point next to the elbows (Fig.26).

Fig 26

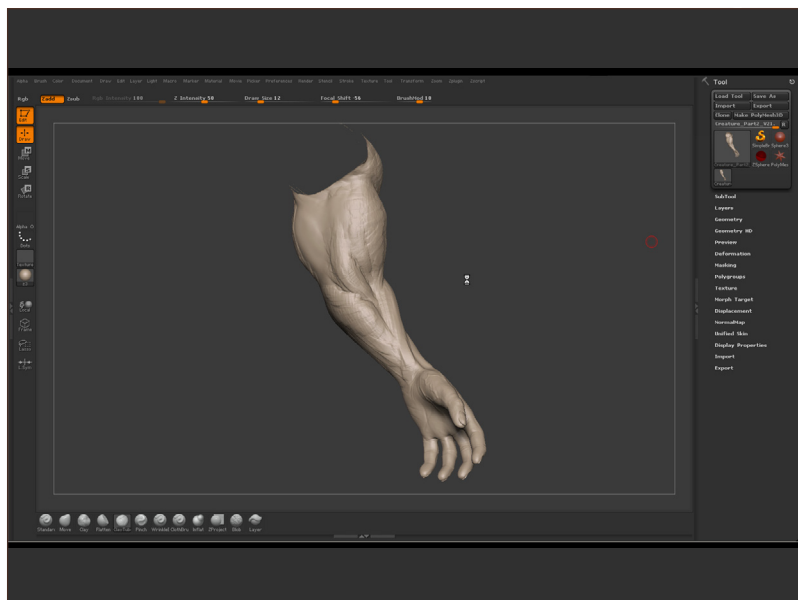






Fig 27a

27. Continue adding muscles, adding volume to the shoulders, biceps and triceps. We don't need to know our anatomy perfectly, the Latin names and insertion points are not essential to producing anatomically accurate models. While it feels good to know the names and all the details and it will help in the long run, it's something we build up knowledge of over time. For now, gathering a lot of reference material and understanding the order the muscles are placed will be enough (Fig.27a – 27b).



Fig 27b

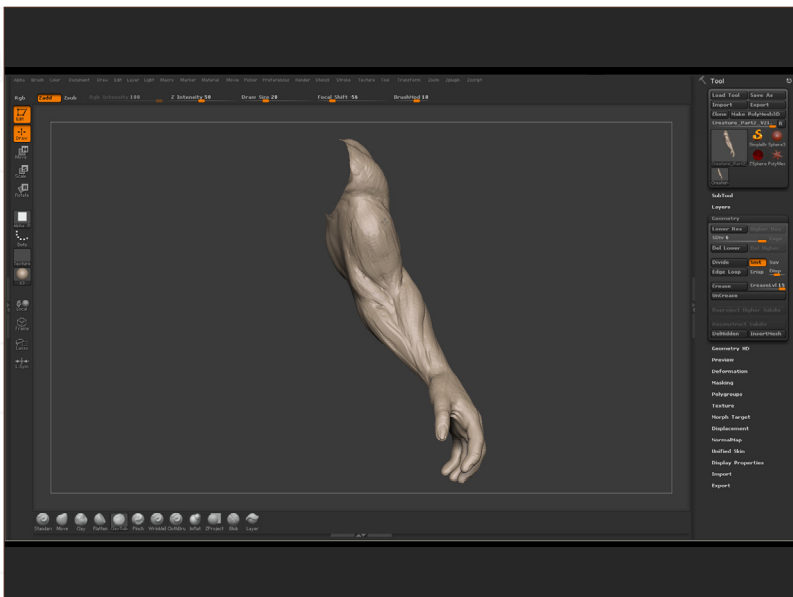


Fig 28a

28. Using photos and anatomy diagrams sculpt the rest of the arm and shoulder muscles (Fig.28a – 28b).



29. A little back story on the character helps here. When working from a concept, sometimes you have ideas or information about the character, and sometimes it's all up to you. The character in our hands looks to be an ex slave. Escaped from the hands of its master, it obviously has a muscular body and possibly that was how it broke free of the chains. Perhaps years of hard labour or forced battle built up its strength until one day it was too much, he was ready to make his escape to freedom. He still carries the scars on his body, but now he is a fine specimen of his species and back home he will reap his rewards.

The arms and chest are large and powerful, and through constant use his muscles are toned and protrude even when at rest. His legs are strong and toned, not for brute force but to run, to give him speed and agility. His face carries a history of abuse and hard years, but visible is his wisdom and resolve.

A little background on our character can help immensely in the creation process. When we have reasons for every change we are doing, we can build up a character with balance, of which all elements feel matched and none are out of place. Scars can be clues to his history, injuries suggest his break for freedom, and even his body hair can suggest things about his species and how he evolved. Its details like these that add elements of uniqueness to your character, things people will remember. Details allow the viewer to fall in love with the character, hate it, or feel pity. Character creation is as much about modelling and texturing as it is building a figure to play a role, be it evil, heroic, sexy, gritty or many others. Great character artists and designers can bring emotion and feeling to models and that emotional connection is what makes a great character (Fig.29).

Fig 28b



Fig 29







Fig 30

30. Our character is complete. Take a break away from the tutorial and make tea, go for a walk, go to the pub, or just get away from the computer screen for a while. After a model is deemed complete, we need to give ourselves time to view it again with fresh eyes. That might mean sleeping and starting again in the morning, or it might mean just a 30-minute break away to get some air. Whatever it may be, after you come back you will be able to freshly view the character and instantly you will know if it's complete or if anything needs to be changed. Usually it is proportion changes that I notice – arms being slightly too short, the head being too far back. Make sure the character looks comfortable in his stance, not too cramped. So take that break and come back and make the necessary changes.

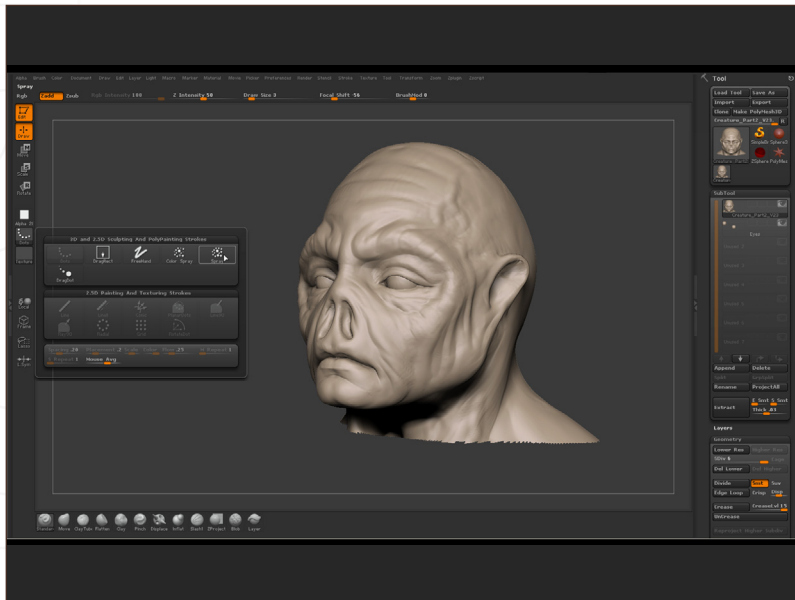


Fig 31a

We can move onto detailing the skin now, once we've decided the model is good to go. Take the Standard brush and in the menu on the left, or in the right-click menu, click on Alpha 01, the default alpha for the Standard brush. We will use a smaller one to spray on circular indentations to suggest areas where hair might sprout from on the face. Choose a smaller alpha from the list that pops up, Alpha 40 being the smallest. Now, even with a large brush our cut will be very precise and small (Fig.30).

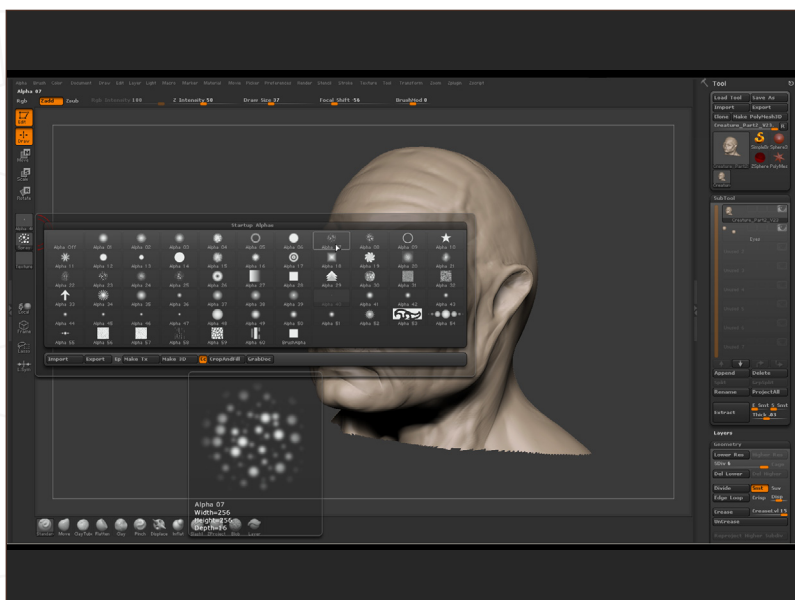


Fig 31b

31. Right-click again and click on Dots, selecting Spray. Spray scatters a number of your alphas around your brush location dependent on your brush size. The depth of each indentation is measured by your pressure, or ZIntensity (Fig.31a – 31b).



32. From the same menu we selected our alpha from, choose Alpha 58. This alpha is normally used just by the Rake brush to perform a series of hard, deep cuts into the model. It's very useful here for blocking out wrinkles that we can later sculpt in more detail.

Instead of using the Spray brush settings here, we should select the Dots or Freehand option. Sculpt strokes from the inside of the lips outwards, radially. This area is high in frequency of wrinkles in older people, and will be good to add large detail to our model (**Fig.32a – 32b**).

Fig 32a

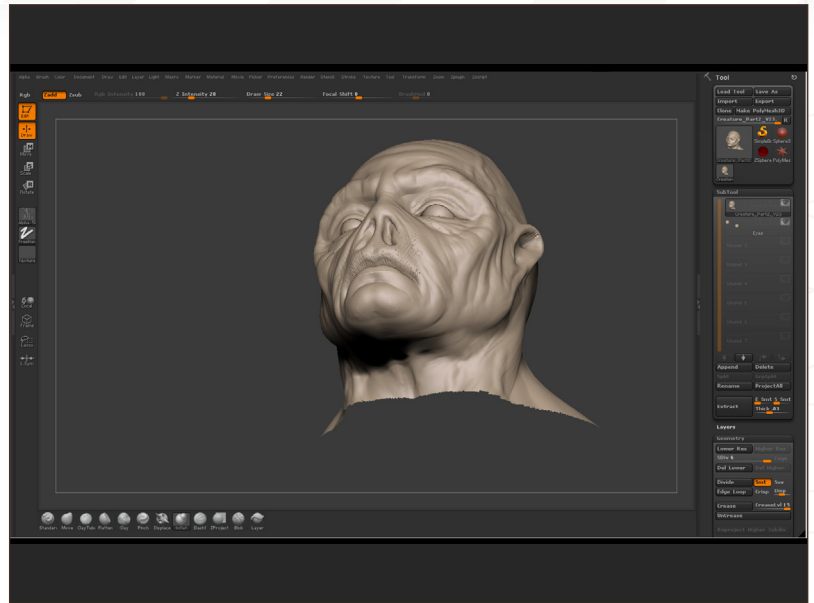
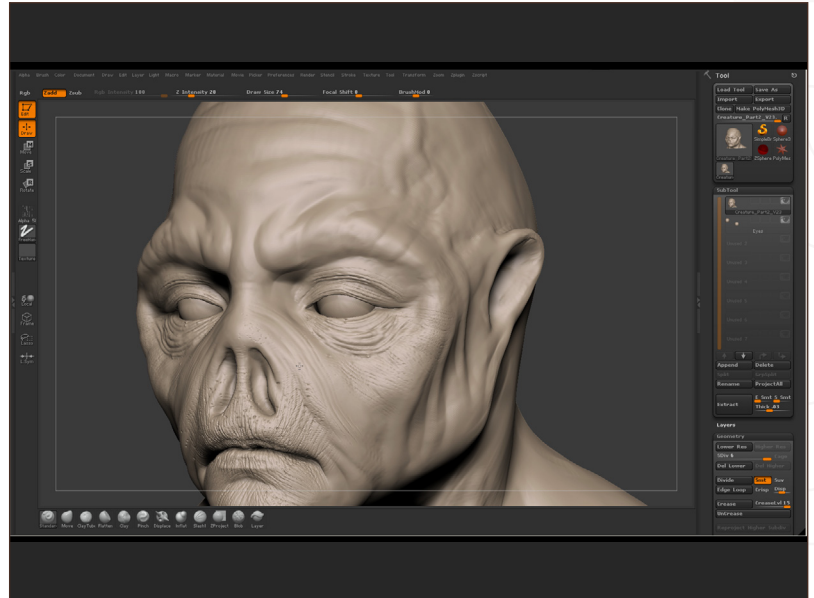


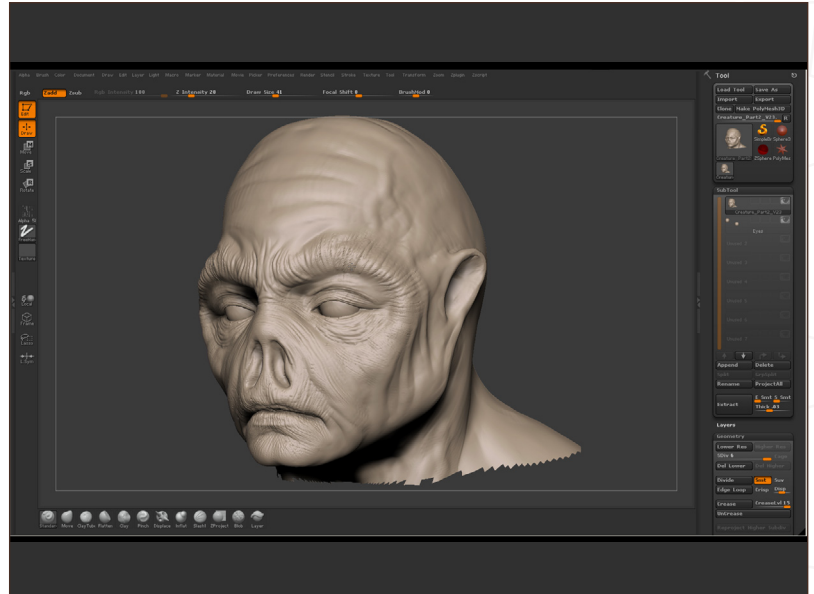
Fig 32b



33. Try to keep skin pores and wrinkles larger than life so they show up on the Normal and Diffuse maps when we move on to texturing. Tiny but accurate skin pores will not show up at all, and serve only to make the map look messy, so they are better left alone.

I also sculpt underneath and above the eyes, adding more bags and wrinkles there also. There are plenty of wrinkles to add in the brow and eye sockets. You can either add wrinkles using the standard brush with the rake alpha and inflating the area, or simply one by one with the wrinkle brush (**Fig.33**).

Fig 33







Change the alpha again to Spray and Alpha Lightly run this over the face of the model to add a bit of variation in the smoothness of the skin. You can use different alphas to produce as much detail as you want in the face, but remember to keep an eye on the level it's viewed at. Alphas can be made from almost anything by creating a greyscale image in Photoshop and importing it into ZBrush using the Alpha > Import button. Use photographs with high contrast, such as elephant skin, and close-ups of wrinkles on horses, humans, cows or hippos. Even metal, wood, and concrete can make a sizable alpha collection to be used as stencils or alphas to add detail to a model. In a later part of this tutorial series I will show you how to use stencils when we create the character's weapon. That's it for now; see you in the next part where we'll be working in 3ds Max/ Maya/LightWave and modo artists to continue work on our next gen character.

## CHAPTER 3 - HIGH-POLY MODELLING PART 2

Creature Concept by  
**RICHARD TILBURY**

Tutorial by:  
**JOSEPH HARFORD**

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